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THEORETICAL CONSIDERATIONS RELATING TO SUPPLY*

I. INTRODUCTION

"We should have made," says Marshall,[1] "a great advance if we could represent the normal demand price and supply price as functions both of the amount normally produced and of the time at which that amount became normal." In the October and December, 1925, pages of this *Journal* we have derived the demand curve for sugar and have shown how it shifts its position from year to year as a result of dynamic changes. The curve thus derived may not be "normal" in Marshall's sense. It has, however, the great advantage of being concrete or statistical rather than a priori or hypothetical, and Marshall himself has warned us against the danger of abstract reasoning, especially in connection with supply and demand.

In the following chapters an attempt is made to treat supply along the same general lines as demand. More specifically, it is the object of the following chapters to examine some of the difficulties which arise in the derivation of the elasticity of supply; to indicate how these difficulties may be overcome; to derive the supply curve for sugar; to bring it, if possible, into juxtaposition

* This article forms one chapter in the author's forthcoming book on *Statistical Laws of Demand and Supply, with Special Reference to Sugar*, which will be published shortly by the University of Chicago Press. The graphs are numbered as they appear in the book.

[1] *Principles of Economics* (8th ed.), p. 809.

with the demand curve for the same commodity; to show how the equilibrium of demand and supply changes from time to time; and to indicate the bearing of the results on the tariff on sugar. However, before proceeding to take up concretely the proposed problems, it is advisable to define a few terms and to examine some theoretical considerations relating to supply.

II. THE CONCEPT OF THE ELASTICITY OF SUPPLY

The coefficient of the elasticity of supply might almost be defined by paraphrasing the definition of the coefficient of the elasticity of demand.[2] It is the ratio of the relative change in the quantity supplied to the corresponding relative change in price, when the relative changes are infinitesimal.

In mathematical symbols, the coefficient of the elasticity of supply, e, is

$$e=\frac{dx}{x}\Big/\frac{dy}{y}=\frac{d\log x}{d\log y}=\frac{dx}{dy}\cdot\frac{y}{x} \qquad (17)$$

where x is the quantity supplied and y is the price per unit. Equation (17) is identical with equation (1) page 483, relating to η except that x now stands for the quantity supplied instead of demanded. If e is numerically greater than unity, the supply is said to be "elastic." If it is numerically less than unity, the supply is said to be "inelastic." The size of the coefficient measures the degree of the elasticity.

With regards to this definition the same observations must be made that were emphasized in connection with the definition of the elasticity of demand:

1. The definition presupposes a knowledge of the supply curve. It follows, therefore, that any attempt to derive the coefficient of the elasticity of supply of a commodity without first deriving the equation to the supply curve is apt to lead to difficulties.

2. The coefficient relates to a *point* on the supply curve and may vary in magnitude from point to point. In giving *the* coefficient of the elasticity of supply of a commodity, one must, therefore, specify the point on the supply curve to which it ap-

[2] See this *Journal*, XXXIII (October, 1925), 482–83.

plies, unless the value of the coefficient is the same at every point on the curve.

This, of course, is equivalent to saying that the definition of the elasticity of supply given above is that of "point elasticity" and not "arc elasticity," and the observations which were made on this distinction in connection with the discussion of demand[3] also hold for supply. We shall return to this subject later.

III. RELATION BETWEEN THE ELASTICITY OF DEMAND AND THE ELASTICITY OF SUPPLY

There is an important similarity between demand and supply in regard to elasticity. *In a closed economy the elasticity of supply tends to be numerically equal to the elasticity of demand.* By the term "closed economy" is meant an economy that is self-contained with respect to the commodity under consideration. Thus the United States is a closed economy with respect to potatoes. To get the corresponding economy for wheat or pig iron we must include the whole world.[4]

In such an economy there are no imports or exports. Production is, on the average, equal to consumption. It follows,

[3] See *ibid.*, pp. 485–90.

[4] The importance of the "self-contained economy"—the one that has no relations of importance with anything outside of itself with respect to the commodity under consideration—has been stressed by Professor Cassel:

"First of all, science must always, in discussing causes and effects, take the *whole complex* as the object. It can not stop at any arbitrarily chosen link in the chain. It must consider the totality of occurrences which are in economic reality inextricably connected with one another. . . . .

"The practical consequence for economic science is that, in principle, it must always take an entire economic unit as its object. This means that economic science must always assume the economy which it wishes to analyse, as being enclosed within itself and having no connections with an outside world. For if any such connection should exist, it would be necessary, in order to get a complete view of the totality of the chains of causes and effects, to take even these connections into consideration, i. e., to widen the object of the investigation and regard a greater, but in itself complete economic unit. The unit chosen may be a small one, e. g., an isolated peasant economy, or a large one, the economy of a modern people or of the whole world. The object must be determined by the character of the investigations, but in any case it is essential that it should be a closed economy" (Gustav Cassel, *Fundamental Thoughts in Economics*, pp. 13–15).

See also his *Theory of Social Economy*, pp. 3–4.

therefore, that in such an economy the elasticity of supply tends to be numerically equal to the elasticity of demand when conditions are at all normal.

Though this principle appears to follow from the general theory of economic equilibrium, it must not be assumed that its application is limited to the static economy. It was, in point of fact, derived from a consideration of the methods that are used nowadays to derive concrete, statistical laws of supply and demand and of the results obtained therefrom.

The *statistical* reasoning which leads to this principle or theorem will be postponed until we are ready to derive the supply curve for sugar.[8] At this point we may point out a practical application of the principle under consideration. Assuming that the world is the only self-contained economy with respect to sugar, suppose that we know the elasticity of the world-demand and the elasticity of the supply from all sources except Cuba. By our principle, which states that in a self-contained economy the elasticity of the whole demand tends to be numerically equal to the elasticity of the whole supply, the elasticity of the unknown Cuban supply may be easily estimated from the equation,

$$Q_w\eta_w = Q_c e_c + Q_o e_o \tag{18}$$

where η_w is the numerical value of the elasticity of the world demand, Q_w the total quantity demanded by the world's population; e_c, e_o are respectively the elasticities of the Cuban supply and the supply from all other sources; and Q_c, Q_o are respectively the quantities supplied by Cuba and the other sources, the relation between the quantities or weights being $Q_w = Q_c + Q_o$.

The principle of the equality of the elasticities of demand and supply is, however, true only of short-time supply and demand curves. As Marshall has pointed out in another connection, the matter is more complex in the more fundamental questions which relate to long periods. "For the ultimate output corresponding to an unconditional demand at even current prices would be theoretically infinite; and therefore the elasticity of

[8] This will be taken up in the following chapter.

supply of a commodity which conforms to the law of Increasing Return, or even to that of Constant Return, is theoretically infinite for long periods."[6]

IV. SUPPLY AND COST OF PRODUCTION

The cost curve gives the relation between the cost of production of a commodity and the quantity produced. The supply curve gives the relation between the price of the commodity and the quantity offered for sale or produced. This definition, although perfectly accurate, has, nevertheless, the shortcoming of not even suggesting the problem of the relation between the cost curve and the supply curve. Perhaps this is as it should be, for economists have not as yet succeded in giving an entirely satisfactory explanation of the relation between the two curves. If, however, we are permitted to make the convenient assumption —which is true under equilibrium conditions—that no part of the output is produced at a loss (i.e., that there is no ultra-marginal production), we may define the supply curve as the curve which gives the relation between the marginal cost, or the cost of the last-made portion of the commodity, and the quantity produced. This definition has at least these advantages: It suggests that there is a functional relation between the supply curve and the cost curve; and it leads to a mathematical expression for this relation under equilibrium conditions.

1. *Cost curves.*—The only condition of the cost curve is that the total cost of production of any quantity shall always be less than the total cost of production of a greater quantity, for otherwise the greater quantity would be made, and, if needful, partially destroyed. Mathematically this is expressed by saying that

$$\frac{dy}{dx} > 0 \tag{19}$$

where $y=\phi(x)$ is the total cost of production (not the cost per unit) and x is the quantity produced.[7] There are three types of

[6] Marshall, *op. cit.*, pp. 456, 457.

[7] The verbal part of this definition of a cost curve is based on Henry Cunynghame's definition of a "supply" curve. (See his paper on "Some Improvements in Simple Geometrical Methods of Treating Exchange Value, Monopoly,

cost curves fulfilling condition (19). One of them is shown in Figure 24*A* (curve *OA*). It is the total cost curve (*Gesammtkostenkurve*) of Auspitz and Lieben.[8] The abscissa of any point on this curve represents the total output (production) during a specified period of time—say, one year—and the ordinate the *total cost*.

In Figure 24*B* (curve *sa*) there is shown the more common method of representing the cost curve. Here the abscissa represents the total production, as in curve *OA* (Fig. 24*A*); but the ordinate now represents the *average cost per unit*.

The relation between *sa* and *OA* is simple. If the former be denoted by $f(x)$ and the latter by $\phi(x)$, then

$$\left.\begin{aligned} \frac{\phi(x)}{x} &= f(x) \\ \text{or,} \qquad \phi(x) &= xf(x) \end{aligned}\right\} \tag{20}$$

The theoretical cost curve as defined above must not be confused with the accounting cost curve which has been made familiar to economists through publications of the United States Tariff Commission, the Federal Trade Commission, and other Government bureaus, and which is known technically as Marshall's "particular expenses curve."[9] In the theoretical curve as conceived by Auspitz and Lieben, the abscissas represent quanti-

---

and Rent," *Economic Journal*, II [1892], 40.) The mathematical translation of the definition is, however, quite different from Cunynghame's, which is "that $\frac{dy}{dx}$ must always be greater than $\frac{y}{x}$." The difference between the two mathematical formulas is this: Whereas Cunynghame's formula excludes from the category of "total cost curves" all curves that are not concave upward (Figs. 27*C* and 27*E*), ours (equation [19]) includes them. Cunynghame's mathematical formula is not an accurate translation of his definition.

[8] *Recherches sur la Theorie du Prix* (Paris, 1914), pp. 2–5. Translated from the German *Untersuchungen über die Theorie des Preises* (1889).

By the cost of production of an article Auspitz and Lieben mean "the minimum amount of money which producers of this article, taken together, must receive in order to be able to produce it without loss" (pp. 2–3).

[9] Marshall, *op. cit.*, pp. 810–11.

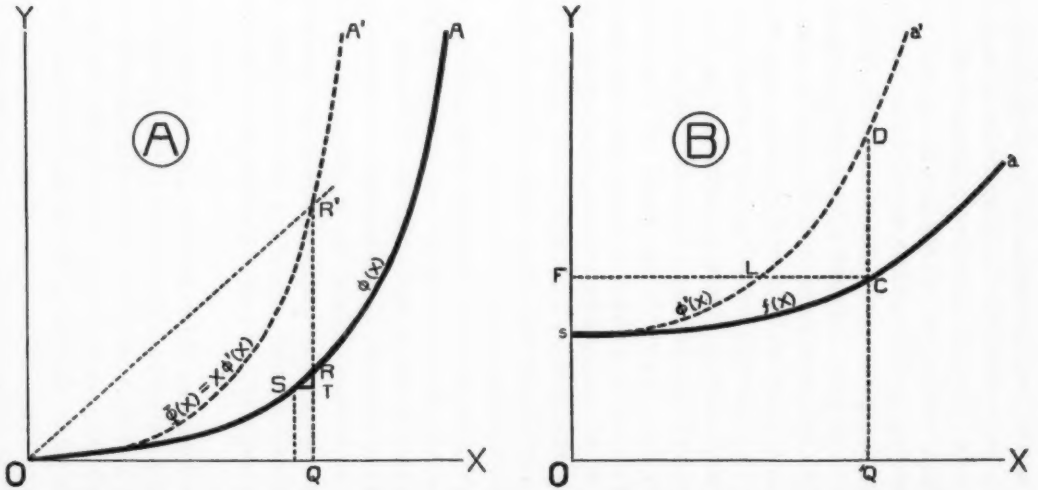

FIG. 24.—Relation between the theoretical cost curve and the theoretical supply curve under conditions of increasing cost.

A, total cost curve, $\phi(X)$, and total supply curve, $\Phi(X)$.

B, unit cost curve, $f(X)$, and unit supply curve, $\phi'(X)$.

ties "which may be produced annually" by all the producers of the article under consideration. A change in the abscissa of the theoretical curve represents, therefore, a change in the *scale of production* from year to year. In the accounting cost curve the abscissas represent quantities which *were produced* by the various producers during the year or period in question. In this curve the scale of production is fixed and is represented by the base of the curve. This base is made up of the bases of a series of adjoining rectangles, arranged in ascending order, each rectangle representing by its base the output (and by its altitude the cost) of one producer during the year under consideration. The theoretical cost curve is expressed by a series of hypothetical or conditional statements thus: "If the annual (or other periodic) output of all the producers were so much, their total cost would be so much; if the annual output were so much again, the total cost would correspondingly vary, and so on." (This does not mean, of course, that the theoretical curve may not be based on inductive investigations.)

The accounting cost curve is expressed by a series of categorical statements thus: During the year (or period) covered by this cost survey, the producer who had the lowest average cost of production per unit had an output of so many units and a total cost of so many dollars; the producers whose average cost per unit was just above that of the lowest cost producer had an output of so many units again, at a cost of so many dollars per unit, making the total cost of the two producers so much, and so on.

Another important difference between the theoretical and the accounting cost curve is that the former does, while the latter does not, give the true relation between changes in cost and corresponding changes in output. The cost data which it has thus far been found possible or practicable to obtain show the *average* cost per unit and the output of each factory under consideration. They do not show the *variation* in the costs of each factory as affected by the factory's output. The result is that the output corresponding to given unit (and, hence, total) costs cannot be derived accurately from such data. Suppose that of

several producers one has an output of 1,000 units at an average cost of $1.00 per unit and the other has an output of 2,000 units at an average cost of $2.00 per unit. This does not mean that all of the 1,000 units of the first producer cost $1.00 apiece to produce and that all of the 2,000 units of the second producer cost $2.00 apiece. Some of the 1,000 units may have cost more than $2.00 apiece and some of the 2,000 units may have cost less than $1.00 apiece. A true cost curve would show the relation between any given cost and the true cumulative output corresponding to this cost. The accounting cost curve, however, cannot show this, for it does not take into consideration the fact that the various units of a factory's output are produced at different costs.[10]

The economists who first made cost-of-production surveys usually organized their data in the form of ogives. They would have done better to have organized the same data in the form of frequency curves, for then the impression would not have arisen that the ogive is the same as the theoretical cost curve *oa* and that it may even be considered a supply curve. For most theoretical purposes, however, neither the frequency curve nor the ogive is as significant as the corresponding curve of total costs.

The relation between the three curves is illustrated numerically in Table V by means of an hypothetical example. In the same table there is also shown the relation between the curve of total costs and the curve of marginal costs (supply curve), which will be explained later. In this example the same data will do service both for the particular expenses curves and the theoretical cost curves.

The first two columns give the frequency distribution of costs. Thus, column (2) tells us that of the total output under consideration (100 tons), 10 tons were produced at an average cost of between $0.50 and $1.50 per ton; 24 tons were produced at an average cost of between $1.50 and $2.50 per ton; etc.

[10] This point was, to the best of our knowledge, first made by Professor Jacob Viner. In his review of Philip G. Wright's "Sugar in Relation to the Tariff" (*Journal of the American Statistical Association*, December, 1924, p. 545) there appears this statement: " . . . . the economist would ordinarily contend that there are different costs for different portions of the output of each producer, and that every producer tends to be a marginal producer with respect to a portion of his output."

To represent the same cost data by an ogive, we simply cumulate the frequencies or output (col. [3]) and plot this cumulative output against the lower limits of the class intervals of column (1). The cumulative frequencies are plotted on the horizontal axis, and the corresponding lower limits of the unit costs on the vertical axis. Sometimes the variables are interchanged; but the method described above is generally used when the data

TABLE V

NUMERICAL ILLUSTRATION OF THE RELATION BETWEEN THE FREQUENCY DISTRIBUTION OF COSTS, THE OGIVE COST CURVE, THE CURVE OF TOTAL COSTS, AND THE CURVE OF MARGINAL COSTS

Average Cost per Ton (Dollars)	Frequency, or Output Produced at Specified Cost (Tons)	Cumulative Output* (Tons)	Cumulative Total Costs (Dollars)	Cumulative Marginal Costs (Receipts) (Dollars)	Unit Costs Derived From	
					Total Costs (4)÷(3) (Dollars)	Marginal Costs (5)÷(3) (Dollars)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
0.50–1.50.....	10	0	0	0	0.00	0.0
1.50–2.50.....	24	10	10	10	1.00	1.0
2.50–3.50.....	32	34	58	68	1.71	2.0
3.50–4.50.....	24	66	154	198	2.33	3.0
4.50–5.50.....	10	90	250	360	2.78	4.0
	100	100	300	500	3.00	5.0

* I.e., output having costs less than the lower limits of the successive figures of column (1).
In any practical problem such errors in quadrature as may be introduced in the process of cumulation ought to be allowed for, especially in the computation of the figures in the remaining columns.

relate to costs, since it is often (erroneously) assumed that the ogive is a true supply curve, and we know that the latter is represented by plotting output as abscissas and prices as ordinates.

Figure 25, *A* and *B*, is a graphic representation of the relation between the ogive and the frequency curve of costs.[11] In constructing Figure 25 the assumption has been made that the total output is fixed at 100 tons and that the first two columns of Table V simply give the costs of the five fractional parts of this output. It is convenient to think of this output as being produced by five different factories (or farms). From this point of

[11] For a fuller description of the relation between the ogive and the frequency curve see Francis Galton, *Natural Inheritance*, p. 38, or Robert E. Chaddock, *Principles and Methods of Statistics*, p. 63.

view the ogive (Fig. 25*A*) is a series of rectangles, arranged in ascending order of height, each rectangle representing by its base the production of a factory (or farm) and by its altitude the highest unit cost of the same factory. It is, in other words, an accounting cost curve of the type made familiar to economists

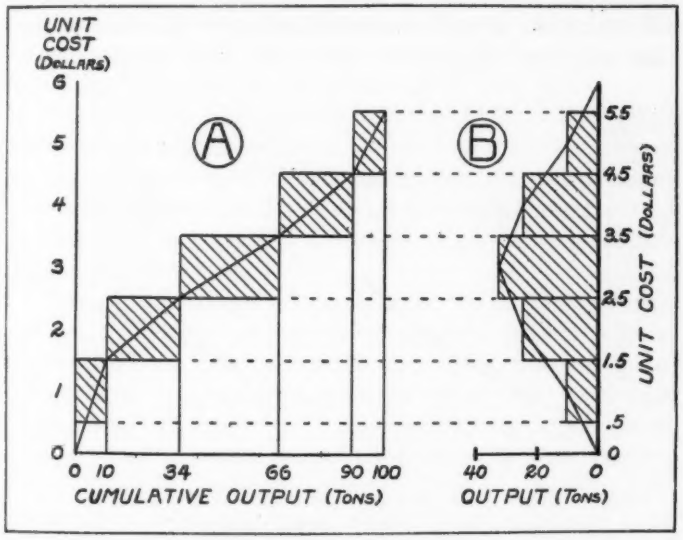

FIG. 25.—Relation between the accounting cost curve, or ogive, and the frequency curve of costs.

A, Ogive of costs, cumulated upward.

B, Frequency distribution of costs.

through the publications of the War Industries Board, the Tariff Commission, the Federal Trade Commission, and other bodies. It is not a theoretical cost curve.

To use the same data for illustrating the construction of the theoretical total cost curve, we must drop the assumption of a fixed output of 100 tons and think of the figures in column (3) (cumulative output) as representing *hypothetical annual outputs of the industry as a whole*. These figures are plotted as abscissas and the corresponding *total costs* as ordinates. The latter are obtained as follows: When nothing is produced, there are

no costs to be incurred (by assumption); the curve therefore begins at the point 0,0, or the intersection of the co-ordinates. The ordinate of this point is represented by the first figure (0) of column (4). When 10 units are produced the total cost is 10 times $1.00 (the mid-value of the first cost interval), or $10.00. This is represented by the second figure in column (4). When 24 units are produced (10+24), the cost of the first 10 units is, as we have just seen, $10.00; and the cost of the next 24 units is 24×

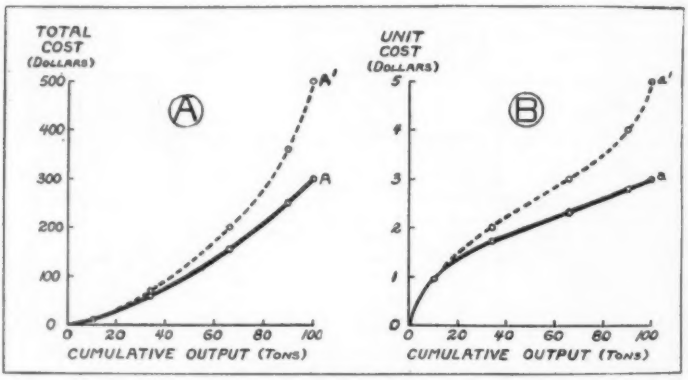

FIG. 26.—Deviation of the supply curve from the cost curve.
A, Total cost curve, *OA*, and total supply curve, *OA'*.
B, Unit cost curve, *oa*, and unit supply curve (curve of marginal unit costs), *oa'*.

$2.00=$48.00 (see cols. [1] and [2]); the cumulative cost of the 34 units is, therefore, $10.00+$48.00=$58.00. This is represented by the third figure in column (4). Proceeding in this manner, we obtain the rest of the figures in column (4).

Figure 26*A* shows the total cost curve thus obtained (curve *OA*). It corresponds to curve *OA* in Figure 24*A*.

If we divide the "cumulative total costs (col. [4]) by the cumulative output (col. [3]), we obtain the average unit costs shown in column (6). When these average unit costs are plotted as ordinates corresponding to the cumulative output as abscissas, we obtain curve *oa*, Figure 26*B*, which corresponds to curve *sa*, Figure 24*B*. Its relation to curve *OA* is given by equa-

tion (20). (The meaning of curves *OA'* and *oa'* will be explained later.)

It will be seen by comparing curve *sa* (Fig. 24*B*) with curve *oa* (Fig. 26*B*) that the former is concave upward while the latter is concave downward. There is no inconsistency in this. The fact that the total costs of a commodity increase at an increasing rate as production increases does not necessarily mean that the average cost per unit must also increase at an increasing rate; the average unit cost may increase at a *decreasing* rate.

It will also be observed that curve *oa* begins at the origin, while curve *sa* begins at a point (*s*) on the vertical axis, above the origin. There is nothing wrong about this, either. The beginning of the unit cost curve is determined by the slope of the total cost curve *OA* at its origin, and the slope may have a positive value even at the origin.

Curve *sa* (or its equivalent, *oa*) must not be confused with the ogive. The latter, as has already been pointed out, may be conceived of as a series of (small) rectangles, arranged in ascending order of height, each rectangle representing by its base the production of a factory (or farm) and by its altitude either the highest or the average *cost per unit of the same factory*. Curve *sa* may also be looked upon as a series of (small) rectangles arranged in ascending order of height and having the same bases as in the ogive, but the altitudes of the rectangles now measure a different variable. They represent *the average cost per unit of all factories whose unit costs do not exceed that of the one under consideration*. In other words, the altitude of each rectangle measures the average (weighted) of the altitudes of all the rectangles to the left of it.

If we had detailed cost data for each factory for a series of years, we would probably find some factories, if not some industries, in which increases in production from one year to the next are accompanied by *decreases* in unit costs—at least within certain limits. Curve *sa* would then be inclined negatively. Few inductive investigations, however, result in such data as would throw light on the most important question of increasing and decreasing costs, partly because most investigations are not con-

ducted with the view of throwing light on economic theory and filling some of the "empty boxes" and partly because such data are very difficult to obtain. All that the ordinary cost of production survey succeeds in showing are the output and the average cost per unit of each factory for the year under consideration. Theoretically there is no more reason for arranging such data according to the ascending order of unit costs and thus obtain an ogive that is cumulated upward than for arranging them according to the descending order of unit costs and thus obtain an ogive that is cumulated downward. Just as the former does not suggest increasing costs so does not the latter suggest decreasing costs. To obtain some light on the problem of increasing or decreasing costs, we must find the relation between changes in the *scale* of production from one year to the next and corresponding changes in costs.

The general presumption, however, is against the existence of decreasing cost industries in a régime of free competition, if by an industry we understand, with Professor Frank H. Knight, the entire process (all stages) of producing the article in question.[12]

2. *Supply curves.*—Returning now to the theoretical curve of total costs (*OA*, Fig. 24*A*) we recall that the abscissa of any point on the curve represents the quantities which can be produced and sold annually and the ordinate the total cost of production. This amount, however, is not what producers, taken collectively, will actually receive, for they will try to obtain a price which is over and above the cost of production. How can the amount actually received by the producers be determined? What is the relation between cost of production and price?

Let *OQ* (Fig. 24*A*) be the equilibrium production for any one year, and *ST* the last or marginal portion produced. Then *QR* is the total cost of the entire output *OQ*, and *TR* is the cost

[12] "Any branch or stage in the creation of a product which offer continuously a chance for technical economies with increases in the scale of operations must eventuate either in monopoly or in leaving the tendency behind and establishing the normal relation of increasing cost with increasing size" ("Some Fallacies in the Interpretation of Social Cost," *Quarterly Journal of Economics*, XXXVIII (1924), 597.

of the marginal portion. Under free competition the marginal cost per unit is equal to the price, or the price is $TR:ST$. But in a free market each unit of the produce must be sold at the same price as any other unit, so that the total annual output OQ will be sold at exactly the same price as the last portion, ST. This means that the sum of money Y' received for OQ must obey the relation

$$Y' : OQ :: TR : ST$$

or

$$Y' = \frac{TR}{ST} \times OQ = QR' ,$$

which is greater than QR.

Now let the equilibrium production be any other value than OQ. By the same reasoning we compute a new value for Y' corresponding to the new equilibrium.

Proceeding in this manner, we obtain a series of points which, when joined together, give the new curve OA'. This curve is above OA if the latter is concave upward.

The same curve may be obtained by a slightly different method, as follows: Through the origin O draw a line parallel to the tangent of the total cost curve at the point R. This line crosses the prolongation of the ordinate of the point R at R'. The length QR' gives, as before, the total amount of money which must be paid to all producers if they are to produce the quantity OQ, for $QR' : OQ :: TR : ST$. Make the same construction for all other points of tangency on curve OA, and you obtain the new curve OA', as before. This, in fact, is the method followed by Auspitz and Lieben.

Each ordinate of the curve OA' gives the actual amount which must be paid to all the producers if they are to be induced to produce, during the year, the quantity of the article represented by the corresponding abscissa. Or better still, the ordinates of this curve indicate the amounts of money against which are offered, in fact, the quantities annually produced and designated by the abscissas. Accordingly, Auspitz and Lieben have named this curve the total or collective supply curve (*Gesammtangebotskurve*).[13]

[13] Auspitz and Lieben, *op. cit.*, p. 8.

Mathematically, the relation between the total supply curve OA' and the total cost curve OA is

$$\Phi(x)=x\phi'(x) \tag{21}$$

where $\Phi(x)$ is the total supply curve and $\phi(x)$ is the total cost curve.

If we divide the ordinates of the curve OA' by their corresponding abscissas we obtain a new curve $sa'=\phi'(x)$ (Fig. 24*b*), or

$$\frac{\Phi(x)}{x}=\phi'(x) \tag{22}$$

which is related to OA' in the same way as sa is related to OA. (See equation [20]). This curve, which has been called by Professor Pigou "the curve of marginal supply prices"[14] and by Professor Young "the curve of aggregate expenses,"[15] we shall call simply "the supply curve," in order to show its relation to the Auspitz and Lieben "total supply curve" (*Gesammtangebotskurve*), OA'.

This curve is thus related to sa. If the ordinate at any point of the abscissa, Q, (Fig. 24, B), intersects sa at C and sa' at D, the area $OQDs$ is equal to the area $OQCF$, or, in symbols,

$$\int_o^x \phi'(x)dx=xf(x)=\phi(x) \tag{23}$$

But the area $OQCF=xf(x)=QR$ (Fig. 24, A) represents the total cost of production of the quantity OQ. Accordingly the line QD—or, more exactly, the little rectangle of which the line

[14] A. C. Pigou, *The Economics of Welfare* (1920), p. 931. See also Professor Pigou's article on "Producers' and Consumers' Surplus," *Economic Journal*, XX, 358–70.

[15] A. A. Young, "Pigou's Wealth and Welfare," *Quarterly Journal of Economics*, August, 1913, pp. 676–77.

Professor Young seems to prefer this term because the *area* inclosed by this curve (sa', Fig. 24, B), the two axes, and the ordinate at any point "represents the aggregate expenses" of producing OQ units. But it is more common to designate a curve after the variable measured by its *ordinates*. From this point of view it would be better to confine the term "curve of aggregate expenses" to OA' (Fig. 24, A) and to call sa' by some other term, if the one used by Pigou is open to objection.

is the height and a small unit of produce is the base—represents *"the addition to the total cost incident to the production of an additional unit."*[16]

But, it will be asked, "Is not this the very definition of *QC*? Your mathematics to the contrary, notwithstanding, how can the increment in cost be *QD*?" The answer is that the two lines represent different concepts of marginal costs. The former is the increment in cost consequent on an increment in production when the prices of the factors of production are given. The latter is the increment in cost consequent on an increment in production, when the prices of the factors of production are *not* given, but vary with changes in the scale of production. That is, *QC* is the marginal unit cost from the point of view of the entrepreneur whose production is too small as compared with the aggregate output to affect the prices of the factors of production. But *QD* is the marginal unit cost *viewed socially*.[17]

Reference to Table V and Figures 26*A* and 26*B* will make this clear. When the output is 10 tons (col. [3]) the average cost is $1.00 per ton (i.e., the midpoint of the first cost interval of column [1]), and the total cost is $10.00 (col. [5]). This is a point common to both curve *OA* and curve *OA'* (Fig. 26*A*). When 24 *more* tons are needed, these cannot be produced cheaper than at $2.00 per ton (i.e., the midpoint of the second cost interval of col. [1]). This is (approximately) the cost of the last unit which is equal to the price. If it be assumed that the higher unit cost of the second dose will not affect the unit cost of the first 10 tons, the total cost would be (10×$1.00) + (24×$2.00)=$58.00 (col. [4]). This is a point on curve *OA* (Fig. 26*a*). But under free competition the price of the factors of production—including, of course, the rent of land—will be bid up when the price rises to $2.00 per ton, so that even the first dose of 10 tons will now cost $1.00 per ton *more* than formerly. That is, *viewed socially*, the increased cost of obtaining the additional 24 tons is not merely $48.00 but $58.00, or the cumulative (marginal) cost of the 34 (10+24) tons is $68.00 (col. [5]).

[16] F. Y. Edgeworth, *Papers Relating to Political Economy*, II, 433.

[17] This interpretation differs from that given by Edgeworth. See *ibid.*

This is a point on curve OA' which is now above curve OA. Proceeding in this manner, we obtain the other figures of column (5), or the other points of curve OA'. The difference between $68.00 and $58.00, or, more generally, the difference between any figure in column (5) and the corresponding figure in column (4), corresponds to the difference between QR' and QR (Fig. 24A).

Dividing the cumulative marginal costs (col. [5]) by the cumulative output (col. [3]), we obtain the marginal *unit* costs of column (7). Curve oa' (Fig. 26B), represents these unit costs. It is the ordinary supply curve. It corresponds to curve oa' (Fig. 24B). Its relation to curve oa is given by equation (23).

3. *Laws of cost.*—In the foregoing analysis of the relation between the cost curve and the supply curve, the total cost curve was drawn concave upward, and it was shown that when the cost curve is of this type the supply curve is *above* the cost curve. Although this is a common type of cost curve, it is by no means the only one fulfilling the general condition of the cost curve (see equation [19]) that the total cost of production of any quantity shall always be less than the total cost of production of a greater quantity, for otherwise the greater quantity will be produced, and, if needful, partially destroyed. There are two other cost curves which fulfil this condition. One is concave downward, and the other has no curvature, being a straight line. The three curves, together with the unit cost curves derived from them are shown in Figure 27. It can easily be shown that when the cost curve is concave downward, the curve of marginal costs is *below* the cost curve, and that when the cost curve has no curvature, the curve of marginal costs coincides with the cost curve.[18]

But whether the curve of marginal costs is above or below the cost curve, it is clear that any dealer to sell at all, must ex-

[18] By equation (21) the curve of marginal costs $\Phi(x)$ is thus related to the cost curve $\phi(x)$. $\Phi(x)=x\phi'(x)$. In Figure 27, A and B, $\phi'(x)$ is an increasing function of x as x increases, hence $\Phi(x)$ is *above* $\phi(x)$. In Figures C and D, $\phi'(x)$ is a decreasing function of $\phi(x)$ as x increases, hence $\Phi(x)$ is *below* $\phi(x)$. In Figures E and F, $\phi'(x)$ is a (positive) constant, hence $\Phi(x)=\phi(x)$.

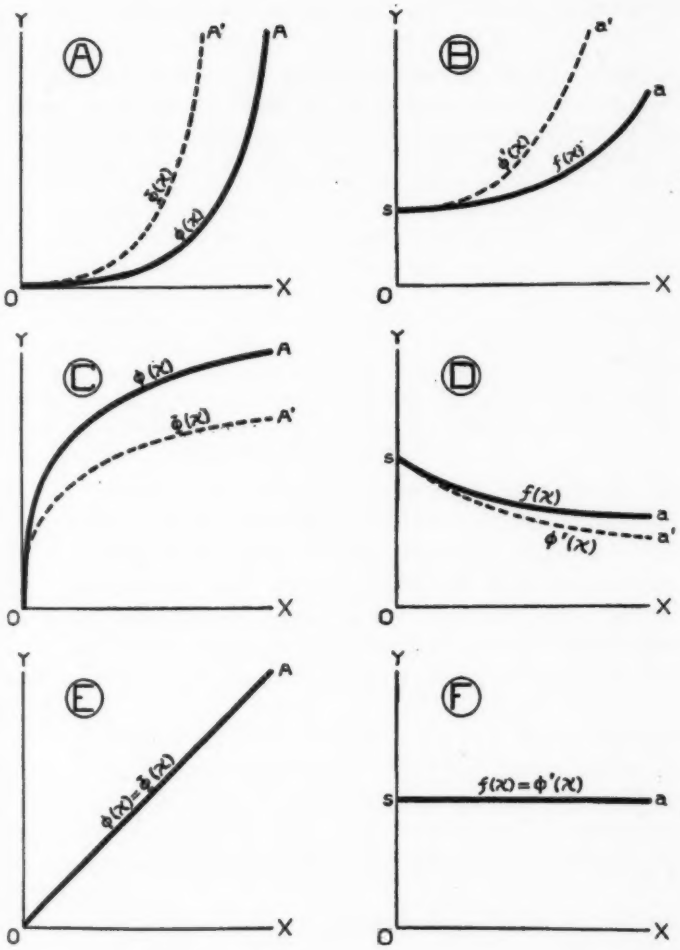

FIG. 27.—The three laws of cost.

Figures *A*, *C*, and *E* represent the three kinds of *total* costs, while *B*, *D*, and *F* represent the corresponding *unit* costs. The dotted curves represent *marginal* (total and unit) costs.

pect to get back at least the total cost. As Professor Fisher puts it,

> This means that he must, therefore, charge a price *at least* as high as the *average* cost per ton. When the cost of each successive ton is *greater* than that of the preceding ton, the cost of the last, the marginal cost, is the greatest cost of all, and therefore exceeds the average cost. Consequently, the dealer is assured a profit when selling at a price equal to the marginal cost. But when the cost of each successive ton is *less* than that of the preceding ton, the cost of the last ton (marginal cost) is the least of all, and therefore is less than the average cost. To sell at a price equal to marginal cost would, in this case, mean to sell at a loss.
>
> In either case, whether the curve ascends or descends, the seller will seek to determine his price on the basis of the higher of the two costs (marginal and average). Whichever of the two is the higher will be the one to appear in the supply curve. When the marginal cost increases with supply, marginal cost is the higher, and will rule supply. When the opposite is true, average cost is the higher, and will rule supply.[19]

But if the cost curve descends to the right, it can easily be shown[20] that such a condition will lead to cutthroat competition and ultimately to monopoly. A descending cost curve is, therefore, incompatible with the assumption of free competition. Under free competition the supply curve is above the cost curve.

It is clear, therefore, from the foregoing, that, given the cost curve, we can find the corresponding supply curve; and vice versa.

The shape of the total cost curve not only determines the shape of the corresponding supply curve but it also enables us to state the laws of cost in an unequivocal manner. This will be illustrated by a consideration of the laws of cost as conceived by two of the greatest mathematical economists, Cournot and Edgeworth.

Cournot, who was the first to give a description of the laws

[19] Irving Fisher, *Elementary Principles of Economics* (1913), p. 316. See also Luigi Amoroso, *Lezioni di Economia Matematica* (1921), pp. 167–87, where he distinguishes between *costo unitario, costo marginale,* and *costo virtuale.*

[20] Fisher, *op. cit.*, pp. 317–23; see also note 12, above.

It was Cournot, however, who first pointed out that a negatively-sloping cost curve is incompatible with the assumption of free competition. See his *Researches into the Mathematical Principles of the Theory of Wealth* (Bacon's translation), pp. 91–92.

of cost or return in mathematical form,[21] shows that if $y=\phi(x)$ is the equation to the total cost curve, then there are three types of laws of cost according as

$$\phi''(x) \gtrless 0 . \tag{24}$$

Of this statement of the laws of cost Professor Moore says:

> He [Cournot] avoided many difficulties by contenting himself with a mathematical definition of the laws without passing on to identify them by name as the law of diminishing return, the law of constant return, and the law of increasing return. Without using the customary unprecise definitions he amply made good his claim that the condition whether $\phi''(x) \gtrless 0$ exerts very great influence on the principal problems of economic science. *It would be conducive to clearness and accuracy if the Cournot criterion $\phi''(x)$ were regarded as the criterion of laws of cost or laws of return.*[22] [Italics ours.]

The late Professor Edgeworth gives several definitions of the laws of cost, most of them being basically translations in words of the Cournot criterion (24).

His *provisional definition* may be stated as follows: When on the production of two successive equal doses of produce the increment of cost due to the first dose is less than the additional increment due to the second, the law of increasing costs is said to act; and conversely it is a case of diminishing costs when the increment of cost due to the first dose is greater than the increment due to the second.[23]

[21] *Researches into the Mathematical Principles of the Theory of Wealth* (Bacon's translation), pp. 58–61.

In addition to these three types, Cournot considers a fourth, where the total cost curve is a horizontal line, i.e., where $\phi(x)$ is a constant.

[22] "A Moving Equilibrium of Demand and Supply," *Quarterly Journal of Economics*, XXXIX (May, 1925), 360, 361.

[23] F. Y. Edgeworth, *Papers Relating to Political Economy*, I, 61–69, paper on "The Laws of Increasing and Diminishing Returns."

For numerical illustration of this definition, based on Professor T. N. Carver's example, see p. 63.

Most of Professor Edgeworth's examples and definitions relate to the laws of *return*, rather than to the laws of *cost*. His producing doses and the resulting product are, therefore, mostly expressed in *kind*. "But no essential difference in classification is introduced when we take money as the measure; provided that the prices, both of the product and the factor of production, remain constant while the amounts are varied. For the change thus introduced is simply to mul-

In this definition the two successive doses of produce are assumed to be equal. But now, removing this restriction, we may, by paraphrasing Professor Edgeworth's *general definition* of the law of return, thus state the laws of cost: When on the production of two (not in general equal) doses of produce the increment of cost due to the two doses has to the increment of cost due to the first dose alone a ratio greater than the sum of the two doses to the first dose, the law of increasing costs is said to act; and conversely if the former ratio is less than the latter, the law of decreasing costs is said to act.[24]

The foregoing general definition comprises the particular and limiting case when the first of the two successive doses of produce is the whole production measured from zero; the second dose being larger or smaller according to the purpose in hand.[25] Thus understood, the definition comes to this, that the law of increasing costs acts when the *average* cost per unit of product increases with the increase of production (by an amount that is of an assigned order of magnitude); and the law of diminishing cost, in the converse case.

This definition Edgeworth distinguishes as *secondary;* the general definition being called *primary*. Edgeworth prefers the primary definition,[26] although many other high authorities quoted by him give precedence to the secondary definition.

The primary and the secondary definitions do not neces-

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tiply the axes representing outlay and return, ... each by a constant. But such a change does not alter the character of a curve in respect to convexity or concavity. . . . .

"But money can no longer be ignored when we consider price as varying with the amount put on the market by the individual entrepreneur. . . . ." (*op. cit.*, pp. 68–69).

For this reason it seemed best in this chapter to confine our comments to costs expressed in money rather than to returns expressed in kind.

[24] Let $y=\phi(x)$ be the cost curve. At any point x_1 increasing or decreasing costs are said to act according as

$$\frac{\phi(x_2)-\phi(x_0)}{\phi(x_1)-\phi(x_0)} > \text{or} < \frac{x_2-x_0}{x_1-x_0}$$

where $x_0<x_1<x_2$.

[25] Putting $x_0=0$ in note 24, above.

[26] For his grounds see *Papers Relating to Political Economy*, pp. 70 ff.

sarily lead to the same conclusion as to the kind of law of cost that may be operating in a given industry. For example, if the total cost curve OA (Fig. 24A) did not begin at the origin O but at a point above the origin, thus indicating an industry in which an initial outlay is required before any production could take place, it would have a tract—that extending from the new origin to the point where a tangent from O touches the curve—over which increasing costs would prevail according to the primary definition and decreasing costs according to the secondary definition. Beyond the point where the tangent touches the curve, increasing costs would prevail in both senses.

It will be observed that the statements of the laws of cost as given both by Cournot and Edgeworth are simply descriptions of the various shapes which the cost curve may assume. There is, however, an important difference between the definitions of the two authorities, which recalls the difference between "point" elasticity and "arc" elasticity of demand.[27] Cournot assumes for convenience that output and cost can move by infinitesimal steps, and that the function connecting output and cost is a continuous function. This assumption, we shall find, is also convenient in the mathematical treatment of concrete, statistical laws of supply. Edgeworth does not necessarily make this assumption. The doses that he considers move by finite steps. This makes it incumbent upon him to specify the magnitude of the doses under consideration.

In his own words:

> In order to make our definition precise it is often necessary to specify the *magnitude* of the doses successively applied. Otherwise it may happen that *both* Increasing and Diminishing Returns may truly be predicted of the same circumstances. This is a paradox familiar to those who are conversant with the application of the differential calculus. It depends on the circumstance that the orders of magnitude which may be neglected are different according to the different purposes contemplated. It is thus—to use Clerk-Maxwell's illustration—that the heterogeneities in the structure of a mound of gravel, which are negligible from the point of view of the military contractor, may be all-important to the worm. For a like reason the surface of a mountain at any assigned point, say that which is exactly underneath the center of gravity of an ascending mountaineer, may appear to him, while he

[27] See this *Journal*, XXXIII (October, 1925), 484–90.

surmounts the rough surface with long strides, to be shaped like a dumpling, concave with respect to the plane of the horizon; but to the beetle creeping up a cup-shaped cavity, convex.[28]

4. *Laws of relative cost.*—In the preceding paragraphs the relation between cost of production and output has been expressed in terms of absolute changes in the total cost and the corresponding absolute changes in output. We shall get a deeper insight into this relation if we also consider the relation between relative changes in total cost and the corresponding relative changes in output.

"Relative cost of production" has been defined by Professor Moore as "the ratio of the relative change of the total cost to the relative change in the total production."[29] If $y=\phi(x)$ is the total cost of production and x is the total amount of production, the symbolic representation of the "coefficient of relative cost of production" is $\kappa=\frac{\Delta y}{y}\Big/\frac{\Delta x}{x}$, or at the limit,

$$\kappa=\frac{dy}{y}\Big/\frac{dx}{x}=\frac{x}{y}\frac{dy}{dx}=\frac{x\phi'(x)}{y}. \tag{25}$$

This criterion gives the information desired by the entrepreneur. He wishes to know, if he increase his output, whether the relative increase in total cost will be greater than, equal to, or less than the relative increase in the output. That is, he wishes to know whether

$$\kappa=\frac{x\phi'(x)}{y}\gtreqless 1.$$

Relative efficiency of organization, ω, gives, under a different form, the same information as the relative cost of production, κ. The criterion ω is defined as the ratio of the relative change in total production to the relative change in total cost. Symbolically,

$$\omega=\frac{dx}{x}\Big/\frac{dy}{y}=\frac{y}{x\phi'(x)}.$$

The information desired by the entrepreneur is whether $\omega \gtreqless 1$.

Since $\kappa=1/\omega$, it is obvious that if the value of either κ or ω is known, the other may be found.[30]

[28] *Papers Relating to Political Economy*, I, 65.

[29] "A Moving Equilibrium of Demand and Supply," *Quarterly Journal of Economics*, XXXIX (May, 1925), 359.

[30] *Ibid.*, pp. 359–60.

Accordingly as $\kappa \gtreqless 1$ we have to do with the law of increasing relative cost, the law of constant relative cost, the law of decreasing relative cost. "Just as Cournot's criterion $\phi''(x)$ is the criterion of laws of cost or of return, so the coefficient κ may be regarded as the criterion of laws of relative cost or of relative return."[31]

Professor Moore shows, however, that the law of cost is a broader conception than the law of relative cost. He concludes his examination of these concepts as follows: "The criterion $\phi''(x)$ is more inclusive than the criterion κ: where κ occurs in a particular form the corresponding form $\phi''(x)$ always occurs, but when $\phi''(x)$ exists in any particular form the corresponding condition of κ may or may not be fulfilled."[32]

V. ELASTICITY OF SUPPLY AND RELATIVE COST OF PRODUCTION

And now we come to a difficult question: What is the relation between the elasticity of supply and the relative cost of production? In answering this question it will be somewhat more convenient to work with the reciprocal of the relative cost of production, or the relative efficiency of organization.

By definition, the coefficient of the elasticity of supply (e) is the ratio of the relative change in the quantity supplied to the corresponding relative change in price (page 438), and the coefficient of the relative efficiency of organization (ω) is the ratio of the relative change in total production to the relative change in total cost. We may assume for the purpose in view that "the quantity supplied" is equal to "the total production." The relation between e and ω must, therefore, be sought in the relation of price to the relative change in total cost.

We have seen, however, (pp. 450–54) that the bridge by which we cross from cost to price and back to cost is *marginal* cost, for at the margin of production cost is equal to price. This brings us for the second time to a consideration of the nature of the curve of marginal costs.

In a previous section (pp. 450–57) we have defined the supply curve, or "the curve of marginal costs" as the rate of change of the total cost curve, or as $\phi'(x)$, the total cost curve being

[31] *Ibid.*, p. 361. [32] *Ibid.*, p. 364.

designated by $\phi(x)$. This is curve sa' (Fig. 24B). The definition of the elasticity of supply applied to this function ($\phi'(x)=sa'$) is

$$e=\frac{1}{\phi''(x)}\cdot\frac{\phi'(x)}{x}. \tag{26}$$

But a good many, if not most, economists also consider the curve of *average* unit costs, $f(x)$, or curve sa (Fig. 24B), as "the supply curve" even under conditions of increasing cost. This curve is simply the total cost of production divided by the total production, or $f(x)=\frac{\phi(x)}{x}$. The coefficient of the elasticity of supply derived from this function $\left(f(x)=\frac{\phi(x)}{x}\right)$ is

$$e=\frac{\phi(x)}{x\phi'(x)-\phi(x)}=\frac{\omega}{1-\omega} \tag{27}$$

where $\omega=1/\kappa$ is, by definition, $\frac{\phi(x)}{x\phi'(x)}$.

But what is the meaning of these different definitions of elasticity of supply? The answer must be sought in the distinction that we have drawn (see pp. 453–54) between two concepts or marginal costs. There is first the function giving the relation between an increase in cost and the corresponding increase in production when the prices of the factors of production are given. It is the function which represents marginal cost from the point of view of the entrepreneur whose production is too small compared with the aggregate output to affect the prices of the factors of production. The definition of elasticity of supply proper to this concept of marginal cost is equation (27). There is second the function giving the relation between an increase in cost and the corresponding increase in production when the prices of the factors of production are not given, but vary with the changes in the scale of production. It is the function which represents marginal cost from the point of view of society as a whole. The definition of elasticity of supply proper to this concept of marginal costs is equation (26).

VI. TYPICAL EQUATIONS TO THE LAW OF SUPPLY

From the relation existing between cost of production and supply, which has been briefly outlined in this chapter, we can deduce the supply curve from the corresponding cost curve and conversely.

For example, suppose that we have data giving the total costs corresponding to given units of output of a commodity and we desire to find the supply curve corresponding to these data. Since, under conditions of increasing cost, the supply curve is simply the rate of change, or the first derivative, $\phi'(x)$, of the total cost curve, $\phi(x)$, all that we have to do is to fit a curve $y=\phi(x)$ to the total costs and then differentiate this function with respect to x (output). The derived function is the equation to the supply curve.

If it be impracticable to fit a curve to the data of total costs, we may work with the finite differences of the total costs instead of with the derivatives of the function $\phi(x)$. The series of the first differences of the total costs, properly smoothed, may give a fair approximation to the supply curve.

In nearly all inductive investigations, however, it will be impossible to obtain directly the equation to the total cost curve. It will, therefore, be necessary first to derive the supply curve and from it deduce the corresponding cost curve.

This makes it desirable, in the words of Professor Moore, "to select a typical equation to the law of supply so that the constants in the equation shall reflect the connection of supply with the laws of cost."[33]

Professor Moore has shown[34] how the types of the supply equations obviously vary according as the values of the Cournot criterion $\phi''(x)$ or of his (Moore's) own criterion κ are taken as the criteria of the laws of cost.

We shall first derive the equations of supply by means of $\phi''(x)$. The simplest possible assumptions as to the character of $\phi''(x)$ are summarized in (vii) [the (28) of this text]

$$\left.\begin{aligned}\phi''(x)&=a\\ \phi''(x)&=a+bx\\ \phi''(x)&=a+bx+cx^2\end{aligned}\right\} \qquad (28)$$

[33] *Op. cit.*, p. 364.

[34] *Op. cit.*, pp. 364-65.

If $\phi''(x)=a$, then $\phi'(x)=ax+b$, and the variation of marginal cost is described by a straight line. When the law of diminishing return dominates industry, $\phi'(x)=ax+b$ is the equation to the supply curve. In that case, if p_s be put for the supply price per unit of commodity, the supply equation is $p_s=ax+b$. When the law of constant return dominates the industry, $a=o$, $\phi'(x)=a$ constant, and the supply price is $p_s=\frac{\phi(x)}{x}$. When the law of increasing return prevails, the supply price[35] is likewise $p_s=\frac{\phi(x)}{x}$.

More complex equations could be derived in a similar manner from the other assumptions in (28). But it is perhaps advisable, in any concrete investigation, to let the data suggest the most desirable equation for the purpose in view.

The criterion κ, Professor Moore also shows,[36] leads to another useful type of supply curves which is related in form to his "typical equation to the law of demand," to which reference was already made in this *Journal*, XXXIII (December, 1925), 597–98.

VII. SUMMARY

At the outset of this chapter we defined the coefficient of elasticity of supply and postulated an important relation between the elasticity of supply and elasticity of demand. Proceeding to an analysis of the relation between supply and cost of production, we pointed out the general condition of the cost curve, and the difference between the theoretical cost curve and the accounting cost curve, with which it is frequently confused, and between the cost curve and supply curve. Continuing our analysis, we noted that the shape of the total cost curve not only determines the shape of the corresponding supply curve but also enables us to state the laws of cost and the laws of relative cost in an unequivocal manner, and we derived the equations connecting relative cost of production and elasticity of supply. Finally, we noted that the simple functional relation between the cost of production curve and the supply curve makes it desirable to select a typical equation to the law of supply whose parameters shall reflect the connection of supply with the laws of cost,

[35] Marshall, *Principles of Economics*, 4th edition, p. 539, note 1. Fig. 36.

[36] *Op. cit.*, pp. 365–67.

and we described briefly Professor Moore's system of typical equations to the law of supply.

But the supply curves which have been treated thus far are purely theoretical supply curves. Although they should throw important light on concrete inductive supply curves, they are not themselves based on the facts of any industry and they lack, therefore, the utility and interest which would attach to the concrete, statistical supply curves. How can statistical supply curves be derived? How, for example, can the relation between changes in the output and changes in the price of sugar be determined quantitatively? This is our next major problem.

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A RE-EXAMINATION OF THE DOCTRINE OF COMPARATIVE COSTS

The dependence of foreign trade upon the relative costs of production of different commodities in different countries has always been recognized by the economists. Adam Smith, in his defense of free trade, argued that every country should import, rather than manufacture, those commodities which it can buy more cheaply than it can produce. Ricardo pointed out that relative costs, rather than absolute costs, should be considered in the analysis of international trade. Mill expanded this doctrine and restated it with great clearness.

In all the discussions of the relation between cost and foreign trade there has been scarcely any attempt to define the different concepts of cost which have been employed. It is evident that the concept of cost of production, embodied in the cost-of-production, or flexible, tariff in the Tariff Act of 1922, is not the same as the cost-of-production concept employed by the classical economists. It becomes necessary, therefore, to define and to distinguish between the different concepts of cost which have been and are being employed.

The classical economists, in their exposition of the principles of foreign trade, measured cost in days of labor expended. Thus, they said that if it takes 10 laborers 10 days to produce commodity *A*, and 10 laborers of the same ability 5 days to produce commodity *B*, commodity *B* costs one-half as much as commodity *A*. They consciously disregarded the contributions of the other factors of production, because they were trying to simplify their exposition. The cost of producing a commodity or service includes the laborer's expenditure of energy, the mental discomfort caused the capitalist by his voluntary postponement of his claims on consumers' goods, and whatever sacrifices or contributions the entrepreneur may be considered to give. The psychologist might attempt to measure all these expenditures and sac-

rifices in one common unit, just as the physiological chemist reduces all food values to calories. Ricardo and Mill undoubtedly recognized the contributions of the other factors of production, but laid no stress on them in their exposition because of the difficulties of finding a measurement common to all.

It can be urged that, as the economist's standard is money, he should have no reluctance in introducing money into these illustrations. The most obvious objection to the introduction of money in the analysis of foreign trade arises from the fact that gold is also a commodity, and that money price, or the relation of gold to the other commodities, often complicates the simple value relations between the commodities. A more subtle objection to the introduction of money results from the difference between sacrifice cost and money cost. The money wage paid the laborer does not necessarily measure the laborer's sacrifice. The same is true of the other shares in distribution. The total amount of rent, interest, and profits paid in the United States might be equal to one-half the total amount of wages paid; but there is a question as to whether this would indicate that the capitalists and the entrepreneurs suffered exactly one-half as much disutility (or even contributed one-half as much service) as the wage-earners. The classical economists clearly believed that sacrifice costs are more fundamental and that money costs are mere surface aspects of the underlying realities. But more of this later.

The objections to the introduction of money into the theory of foreign trade seem to me outweighed: first, by the fact that international trade is principally carried on through the medium of prices and not by barter; and second, by the desirability of expanding the doctrine of comparative costs in a way that the classical economists never hoped to do. However, the errors which the introduction of money encourages should be guarded against at every stage in the reasoning.

Ricardo and Mill really demonstrated very little except the two most fundamental principles of international trade. The first principle is that even if a country, *A*, produces two commodities at lower costs than does another country, *M*, free trade

would not destroy the industries of country *M*, but would encourage country *A* to specialize in the commodity in which it has a comparative advantage, and country *M* to specialize in the other commodity. The second principle is that such specialization would increase the total production of the two countries. For the purpose of proving these principles it was not necessary to introduce money or prices.

Mill, however, went farther when he considered the relation between the prices finally established by free trade. Although he did not attempt to give a concrete formula for determining these prices, he showed that they are in the same ratio to each other as are the demands of each country for the other country's product. But as Professor Nicholson has pointed out, when Mill was all through he had merely proved that demand would establish a relation between the world-prices of the two commodities produced by the two countries, such that the imports of each country would be balanced in terms of money by its exports. Mill and Ricardo were obviously not interested in arriving at equations for the prices established by trading relations.

Like many who came after them, including Professor Graham, of Princeton, the classical economists overemphasized the effect of the social advantage of international trade and failed to realize the importance of the entrepreneur in such trade. They had little difficulty in proving, without introducing the question of money, that the total product of the two countries could be increased by international trade, but they would have had far greater difficulty had they attempted to consider the effect of such trade on the entrepreneurs who direct it. Foreign trade is never engaged in by two countries merely because the countries are conscious of the doctrine of comparative costs and of the possibility of increasing the total product; foreign trade is carried on by entrepreneurs and consumers who compare the prices in domestic and foreign markets and who find profits or benefits to be gained. Entrepreneurs consider their own money costs of production, and not the sacrifice, or social, costs.

The cost studies carried on by the Federal Trade Commis-

sion, by the United States Tariff Commission, and by the other branches of our government have shown that entrepreneurs' money costs can be arranged to form a cumulative ogive. The average price realized by all the entrepreneurs in a normal year should cut this curve at a cost which has been defined as the bulk-line cost. This bulk-line cost is the statistical analogue of the marginal cost of economic theory. Thus, normal price can be defined as the price which is equivalent to the marginal cost in a normal year. This normal price includes no profit for the marginal entrepreneur, but does include profits for those below the margin. This normal price is the consumer's money cost. After making certain assumptions, this normal price can also be considered a rough monetary measure of the social cost. It is the money price which presumably gives laborers normal wages; owners of land and capital goods, normal rents; capitalists, normal interest payments; and entrepreneurs, normal profits. Thus, if these payments tend to measure the sacrifices of the factors of production, normal price can be taken as a rough monetary measurement of the costs, which the classical economists were considering. They were not considering an average of the accounting costs of the different entrepreneurs, as such average would have included no profits. Furthermore, even if the money costs in normal periods do not measure the true sacrifice costs of the factors of production, these money costs have a more direct bearing on the equation of exchange than do sacrifice costs, because trade depends upon money prices, and therefore on money costs, rather than on sacrifice costs. To the extent that normal money price does not measure marginal sacrifice cost—as, for example, in some old-world countries where laborers are badly organized and underpaid—the classical illustrations were faulty in neglecting the money aspect of their problem.

When Mill said that ten yards of cloth exchanged for fifteen yards of linen in England, he must have meant that the normal price of ten yards of cloth was the equivalent of the normal price of fifteen yards of linen. It is only consistent to apply Mill's ratio between cloth and linen to the marginal producers. In

other words, Mill's example must be interpreted as if he had assumed that the marginal producer of linen could make one and one-half yards in the same time that the marginal producer of cloth could make one yard. In this way, Mill's ratio can be assumed either for cost (marginal cost) or for price (normal price), because they are identical.

In determining the advantages of international trade to the entrepreneur, we must consider the difference between the average of the entrepreneurs' costs and the marginal entrepreneur's cost (or normal price). This difference is the profit per unit of product realized by all the entrepreneurs on all the production. If the ratio assumed by Mill is to be applied to the marginal entrepreneurs' costs of cloth and of linen in England, it would be gratuitous to assume that this same ratio also applies to the average costs of these two commodities in the same country. It may be argued that there is no reason why the ratio for the marginal costs should differ from the ratio for the average costs in a normal year. If a considerable part of one commodity were produced by a few large, low-cost producers, whereas the bulk of the producers of the other commodity were of average size and exhibited a considerable range of costs, the ratio between the marginal costs and the ratio between the average costs might be very different. Thus, to assume the identity of these two ratios is practically to assume that the two cost curves are similar in a strict mathematical sense.

Before showing the danger of making these assumptions in the application of the classical theory of foreign trade, it may be instructive to generalize the examples used by Ricardo and Mill and to introduce in mathematical form the effect of the quantity and velocity of money. The necessity of generalization arises from the objection that figures may be selected to prove different conclusions.

Let us assume that *before* foreign trade between the two countries was engaged in:

Country M made:			Country A made:	
		Price or (Marginal Cost)		Price or (Marginal Cost)
a yds. cloth . .	x'		e yds. cloth . .	$x''=y''/k''$
b bu. wheat . .	y'	$y'=k'x'$	d bu. wheat . .	y''

If in country M a bushel of wheat took two-thirds as much productive energy as a yard of cloth, the marginal money cost of a bushel of wheat may be assumed to be two-thirds as great as the marginal money cost of a yard of cloth. In the example above, k' represents this ratio and is a fraction because a bushel of wheat is assumed to be less costly than a yard of cloth. Thus, the marginal cost of a bushel of wheat (y') is $x'k'$. This cost ratio for country A is k'' and is also a fraction. In Mill's example k' is 10/15 and k'' is 10/20.

Ricardo shows that, after trading relations are established, country M specializes in cloth, and country A in wheat. He points out the desirability of this specialization by showing that *after* trading relations:

Country M would produce:	Country A would produce:
$a+bk'$ yds. cloth	$d+e/k''$ bu. wheat

and that $a+bk'+d+e/k''$ is probably greater than $a+b+e+d$, because $bk'+e/k''$ is greater than $b+e$, since b is reduced by only k', whereas e is more increased by the reciprocal of the smaller fraction k''. Mill developed this doctrine of Ricardo by showing that the world-prices of wheat and cloth, finally established by free trade, would be affected by the demand in each country for the product of the other. He showed that y, the world-price of wheat after foreign trade, divided by x, the world-price of cloth after foreign trade, would be a fraction (R), and that this fraction (R) would have to be less than k' and greater than k''. This relation between R and k' and k'' results from the fact that both industries must profit from the trading relations if they are to be carried on.

After trade has been established:

Country M makes:		Country A makes:	
	Price		Price
$a+bk'$ (or M) yds. cloth . .	x	$d+e/k''$ (or N) bu. wheat .	y

If we assume the same quantity and velocity of money in the two countries before and after trade:

$$(a+bk')x+(d+e/k'')y=ax'+bk'x'+ey''/k''+dy''$$
$$Mx+Ny=Mx'+Ny''$$

Then, Mill's equation:

$$y/x=R$$
$$Mx+NRx=Mx'+Ny''$$
$$x=\frac{Mx'+Ny''}{M+NR}$$

Assuming $x \pm x'$:

$$Mx'+Ny'' \pm to\ Mx'+NRx'$$
$$y''/x' \pm R$$

Thus, wherever y''/x' is less than R, then x is less than x'.

It appears, then, that the price level in the two countries would have to be considered before it could be proved that the price of cloth in country M falls after trade is established. It can be demonstrated that, if the two countries had the same level of prices before international trade, y''/x' must be less than R. Moreover, if country A is assumed to have had a lower price level before international trade than country M, y''/x' must be less than R. Only when country A is assumed to have had a higher price level than country M is the status of this inequality affected. Thus, it is probable that the money price of cloth would be lowered in country M by international trade.

It can be demonstrated that the reverse is true with respect to the price of wheat in country A. When R is greater than y''/x', y is greater than y''. Since R is probably greater than y''/x', the world-price of wheat is probably higher than was country A's price before foreign trade.

Those who make the questionable assumption that the average cost of cloth in country M is reduced in the same ratio as the marginal cost can show that the total money profits of the entrepreneurs in country M after foreign trade (all cloth makers) are less than were the total money profits of the entrepreneurs in cloth and wheat before foreign trade.[1] True, these profits are reduced in the same ratio as the price of cloth is reduced, and the entrepreneurs are presumably no worse off than before. Moreover, although the world-price of wheat, as has been sug-

[1] This allowance for a reduction in the average cost is not predicated upon the principle of increasing return, which will be considered later, but merely upon the new relation between gold and cloth.

gested, is probably higher than was the price of wheat in country *A*, it is probably lower than was the price of wheat in country *M*.

It is well known that entrepreneurs, as well as others, do not always stop to consider the purchasing power of their dollars. Furthermore, the entrepreneurs of country *M* have contracts made on a higher price level for rents and interest payments, and may find it difficult to reduce money wages, so that the average money costs may not be decreased immediately in the same ratio as is the price. This would reduce the real as well as the money profits of the entrepreneurs of country *M*. Furthermore, the entrepreneurs of country *M* would be better off if free trading relations in wheat were allowed; but trading relations in cloth were made impossible by a tariff or otherwise, because their real profits would be increased to the extent that the price of wheat would be reduced.

The most violent conflict of the interests of the entrepreneurs of country *M* with those of the other citizens of that country would occur if country *A*'s price level happened to be lower than country *M*'s. Although the classical economists recognized the importance of price levels, their failure to introduce money into their examples kept them from realizing the importance of this possibility. Although, under freedom of trade, differences in price levels tend to disappear, the entrepreneurs of the United States have had concrete experience, partly because of the tariff, with competition from entrepreneurs who for long periods have produced at lower money-price levels.

If similar assumptions with regard to the ratios of average and marginal costs are made for country *A*, it can be shown that the money profits of the entrepreneurs of country *A* after foreign trade (all wheat-growers) are greater than were the money profits of the entrepreneurs in cloth and wheat in this country before foreign trade. But these wheat-growers can buy no more bushels of wheat with their profits after foreign trade than could the entrepreneurs in cloth and wheat of country *A* before such trade, for the reason that the price of wheat is assumed to increase. If country *A*'s general price level were below country

M's price level before trading relations, the entrepreneurs of country *M* would undoubtedly have much to say in the newspapers and elsewhere about country *A*'s lower standard of living and cutthroat competition. It is probable that the entrepreneurs of country *M*, especially if the price level of country *A* happened to be the lower, would be the group most antagonistic to free trading relations, whereas the consumers of country *M* would have the most to gain from such trade.

Thus, it seems safe to say that even in the examples of the classical economists, the conflict between the consumers' and the entrepreneurs' interests was never properly demonstrated.

Professor Graham, of Princeton,[2] has introduced an interesting qualification to the principle of comparative costs. He has pointed out that a commodity like cloth may be subject to the law of decreasing cost, and one like wheat may be subject to the law of increasing cost. It would appear, then, that the industry of country *M* would be strengthened by foreign trade, whereas the industry of country *A* would only be weakened. If the doubtful assumptions with regard to the similarity of the cost curves and with regard to the relations between average and marginal costs are provisionally granted, it can be shown that the profits of the entrepreneurs of country *M* increase with the decreasing unit cost of cloth, while the profits of the entrepreneurs of country *A* decrease with the increasing unit cost of wheat. Thus, if we admit all of the artificial assumptions of the foregoing examples, we can see that, under the conditions given, the entrepreneurs of country *A* would be strongly antagonistic to the establishment of trading relations, even though such trading might benefit the consumer.

Graham seems to realize that the doctrine of comparative costs does not necessarily imply that country *M*'s wheat industry and country *A*'s cloth industry are destroyed by the specialization resulting from foreign trade, although this possibility is not entirely consistent with the rest of his argument. His rea-

[2] In the *Quarterly Journal of Economics*, February and November, 1923; August, 1924; February, 1925. See also answer to Graham by F. H. Knight in the same journal.

soning assumes that country *M*'s wheat industry continues to exist for a time at least, even though at a disadvantage as compared with country *A*'s wheat industry; and that country *A*'s cloth industry survives even in the face of the advantage of country *M*'s cloth industry. He would argue that the lower marginal cost of *M*'s cloth would enable the entrepreneurs of this country to undersell the entrepreneurs of cloth in country *A*. This would result in an increased production of cloth in country *M* and a decreased production of cloth in country *A*. He shows that the lower marginal cost of country *A*'s wheat would allow the farmers of this country to undersell those of country *M*. This would increase the wheat production of country *A* and decrease that of country *M*. It is not hard to see how Graham concluded that the marginal cloth and wheat costs of country *M* would continue to fall, and the marginal wheat and cloth costs of country *A* would continue to rise, so that the net result "of the specialization is to bring about a situation in which the citizens of *A* get less reward for their efforts than if they had never carried on international trade at all."

The weakness of Graham's reasoning lies either in his failure to recognize sufficiently the differences in the costs of producing a commodity within an industry or in his use of assumptions with regard to the cost curve which the facts of economic behavior do not justify. Graham may have assumed that, as the cloth industry of country *M* expands, every entrepreneur increases his production and decreases his unit cost in approximately the same ratio; that, as the cloth industry of country *A* decreases its production, every entrepreneur suffers an increasing unit cost; that, as the wheat industry of country *M* decreases its production, every farmer finds his cost per bushel decreased; that, as the wheat industry of country *A* expands, every farmer suffers an increased cost per bushel. In short, he reasons that *M*'s cloth-cost and wheat-cost curves throughout their length continue to fall at uniform rates, and that *A*'s cloth-cost and wheat-cost curves throughout their length continue to rise. Graham must make the further assumption that every farmer of country *M* releases a certain number of laborers and

a certain amount of capital to be employed by every cloth entrepreneur of that country, and that every cloth entrepreneur of country *A* releases a certain number of laborers and a certain amount of capital which the farmers of country *A* must use to expand their wheat production.

Let us consider the first assumption of Graham: that, as a result of foreign trade, every producer of cloth in country *M* expands his production, and every producer of cloth in country *A* decreases his production. As a matter of fact, although the lower normal price of cloth in country *M* would result in a destruction of the high-cost cloth producers of country *A*, the low-cost cloth producers of country *A* might also expand their production. It is well known that, although the marginal cost of producing sugar is lower in Cuba than in the United States, there are some domestic producers who can survive without a tariff and who can possibly even compete with the more efficient Cuban producers. We know that in many industries, for example the textile industry, there are low-cost entrepreneurs who might not resist a reduction in the tariff, because such reduction would destroy their high-cost domestic competitors and increase demand. If a combination of the German and French steel plants were to threaten the American industry—and if no adequate tariff protection were granted it—the domestic high-cost steel producers might be driven out, but the United States Steel Corporation might survive and continue to compete with the continental plants. The examples given here are no fanciful exceptions. The investigations made by the Tariff Commission have resulted in cost curves which show for some industries a substantial domestic production at low costs accompanied by smaller, high-cost producers, whose existence is presumably made possible by the tariff.

The second assumption made by Graham involves the transfer of labor and capital from *M's* wheat industry to its cloth industry. The first obvious objection is the usual objection to the economist's assumptions as to the fluidity of labor and capital. Furthermore, if a part of *M*'s expanded cloth production can be assumed to result from the creation of new cloth entrepreneurs,

it is not unreasonable to assume that the new production may be high-cost and may tend to increase *M*'s marginal cloth cost.

The only conditions under which *A*'s cloth industry can be assumed to survive would predicate two cloth-cost curves with marginal costs brought into approximate adjustment.

Graham assumes that every grower of wheat in country *M* decreases his product and, at the same time, his cost. Although agriculture is assumed to be subject to the law of increasing cost, the operation of this law does not take place immediately. Thus, *M*'s wheat production cannot be assumed to decrease indefinitely with an accompanying decrease in cost. Furthermore, why must we assume with Graham that the high-cost cloth entrepreneurs of country *A* all become wheat-growers when the agricultural industry of that country is already assumed to have reached the point where the law of decreasing return is operating? It may very well be that the low-cost cloth entrepreneurs of country *A* can afford to use the labor and capital released by the failure or liquidation of the high-cost cloth entrepreneurs. The United States Steel Corporation went to President Roosevelt and asked to be allowed to absorb the Tennessee Coal and Iron Company when that company anticipated failure. If the low-cost cloth entrepreneurs cannot absorb all of the labor and capital released by the failure or liquidation of the high-cost entrepreneurs, why would these entrepreneurs not use this labor and capital in the production of radios and the development of other new inventions?

If we assume with Graham that country *M*'s cloth industry is operated to capacity before foreign trade starts, so that the capital and labor of that industry cannot be better utilized to make up the world-deficit resulting from the destruction of *A*'s high-cost cloth entrepreneurs, and if we further admit that the expansion of *A*'s low-cost cloth producers still leaves a deficit, we must grant that some of the capital and labor of *M*'s wheat industry is shifted to *M*'s cloth industry. This will reduce the marginal cost and price of wheat in country *M*. Evidently country *A*'s wheat industry must expand to compensate for the decreased production of country *M*'s wheat industry. However, it

has been shown how improbable it is to assume that all of the inefficiently used capital and labor of country *A*'s cloth industry would be shifted to country *A*'s wheat industry. It is most probable that country *A*'s wheat industry would expand but slightly and that country *M*'s wheat industry would not be very much reduced. If we should carry Graham's assumptions with regard to agriculture to their logical conclusions—admitting what we have said with regard to the cloth industries of these two countries—we should find that *M* would soon have a comparative advantage in agriculture as compared with *A*. This would automatically check the developments which Graham's reasoning implies.

The best example of a reversal in the status of comparative advantages is furnished by the history of the United States. Alexander Hamilton realized that the United States had a comparative advantage in agriculture and that the infant manufacturing industries were at a disadvantage as compared with the established industries of Europe. He therefore proposed a protective tariff which stimulated the expansion of the American manufactures. Although a careful reading of the foregoing paragraphs will indicate that we have been building up an attack on Graham's rationalization of a present policy of protection for the United States, we should be the last to contend that Alexander Hamilton's policy was not at that time wise and economical for the United States and for the world. But Alexander Hamilton's reasoning applied to infant manufacturing industries with great potentialities, whereas Graham assumes established and efficient manufacturing industries. No economist will challenge the infant industries argument. However, as a result of Alexander Hamilton's policy of encouraging the infant manufacturing industries of the United States, and as a result of the extension of the margin of cultivation with the increase in population, there has been a shift in our comparative advantage: the farmers are seeking protection, whereas some of our manufacturing industries are reaching out for world-markets.

The dangerous consequences—dangerous for country *A*—of free trade, under the assumptions proposed by Graham, are

really innocuous when properly interpreted. If the two countries are of approximately equal size with established cloth and wheat industries, operating under the laws of increasing and decreasing returns respectively; if the populations of the two countries are assumed to remain stationary; if the demands for the two commodities remain unaffected; and if the quantity and velocity of money remain unchanged: then, the consequences of these assumptions do not contradict the advantages claimed for international trade by the classical economists. All that would result from free trade would be the destruction of the high-cost cloth firms of country *A*. But it would be wrong to assume that all the capital and labor thus released would be shifted to *A*'s saturated wheat industry, when it might be diverted to some other manufacture or to the development of some new invention. The deficit resulting from the destruction of these inefficient cloth producers could be made up by an increased production of those entrepreneurs of country *M* and of country *A* who were not operating to capacity, and by the attraction of some capital and labor from agricultural production, particularly in country *M*. But the status of the two agricultural industries could not be much changed without shifting the comparative advantages of the two countries. Thus, the net result of trade would be to reduce the cost of cloth and divert capital and labor to new production without affecting agriculture to any great extent. However, if the price level of country *A* happened to be lower than that of country *M* before trade started, the entrepreneurs of country *M* would probably have lobbied against such trade unmindful of any immediate benefits to the consumers or future benefits to themselves.[8] Moreover, cloth entrepreneurs of country *A* would not be so dispassionate in their appraisal of the results of such trade.

We are now in a position to judge the essential truths in the theory of foreign trade formulated by the classical economists, and to appraise some of the qualifications which experience and statistical research enable us to add to their doctrine. Ricardo

[8] Graham apparently assumes two equal price levels when he assumes the same cost of "watches."

proved the advantage of foreign trade for society as a whole in the two countries. Mill introduced the question of demand, and thus gave one of the two equations for determining the prices which might be expected to result from foreign trade. But both Mill and Ricardo, by neglecting to introduce the question of money, failed to give another important equation for the determination of world-prices after trade. Furthermore, they seem to have assumed that foreign trade will result in value relations entirely dependent upon sacrifice cost. It has been shown that if money costs do not measure sacrifice costs, sacrifice costs are not determining in the establishment of international price relations. Finally, both Mill and Ricardo, in the formulation of their theory of foreign trade, failed to recognize sufficiently the range of the cost curve and the conflict in the interests of entrepreneurs and consumers.

Without attempting to review the many possibilities for such conflicts, it suffices to say that, no matter how advantageous foreign trade is to society as a whole, the entrepreneurs of industries, like the wheat industry of country *M* and the cloth industry of country *A*, will fight their extinction. Moreover, they have so much to lose that they will fight with far greater energy than do the consumers and the entrepreneurs of the more efficient industries, who might be expected to sponsor free trade. As a concrete example, we can compare the effectiveness of the lobbies in Washington with the inertia of the consumers and the seeming indifference of the great export industries at the present time to all tariff discussion.

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INVESTMENT ACTIVITY IN THE PERIOD 1910–25

Professor Mitchell, in his book, *Business Cycles,* brought his analysis of investment activity through the year 1911. The period from 1911 to 1925 merits consideration for what it may contribute by way of substantiation or rejection of theory already developed. Certain phases of the activity of the investment market have been given attention recently, particularly with reference to the relation of call-loan rates and other money rates to security prices.[1] This paper is designed to consider the volume of sales of stocks and bonds, the volume of issue of corporate securities, and the movements of short-time and long-time rates of interest. But little consideration has been given to the prices of securities. In dealing with some of the material, particularly annual data, Professor Mitchell's methods of analysis have been used.

STOCK EXCHANGE SALES

Professor Mitchell has said that in periods of severe depression investment in bonds increases, while speculation in stocks declines or rises but little in comparison with bond sales. When business begins to revive, both bond and stock sales increase, but bond sales at a much faster pace.[2] Chart I[3] presents annual data in relative amounts of stock sales and railroad and miscellaneous bond sales on the New York Stock Exchange during the years 1910–25 inclusive. Though it is based on annual data, certain conclusions can be drawn.

[1] R. M. Owens and C. O. Hardy, *Interest Rates and Stock Speculation;* W. M. Persons and E. Frickey, "Money Rates and Security Prices," *Harvard Review of Economic Statistics* (January, 1926), pp. 26 ff.

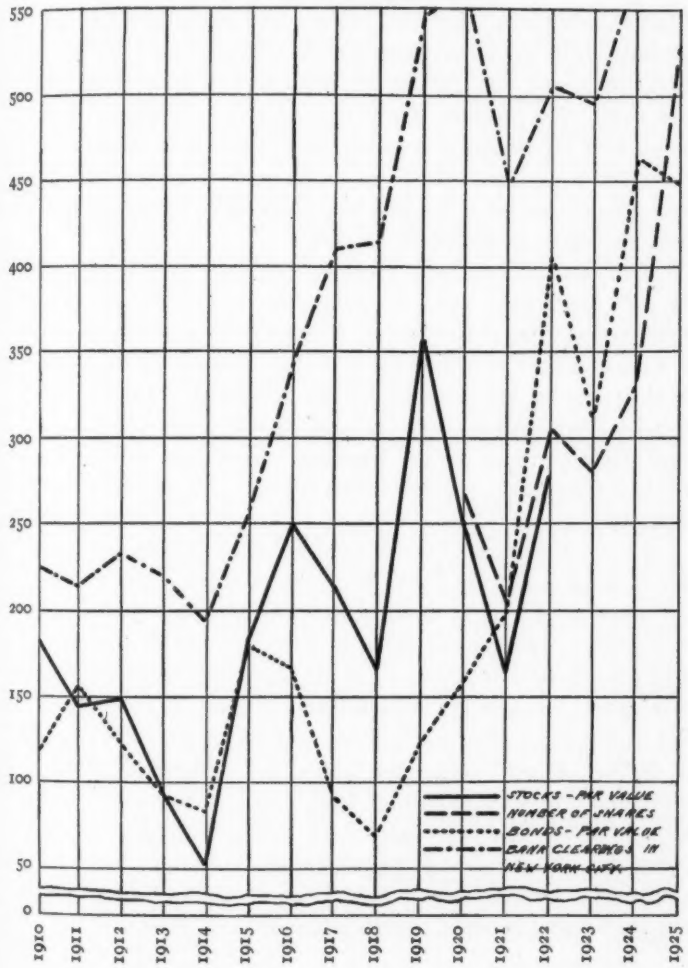
[2] W. C. Mitchell, *Business Cycles,* p. 393.

[3] This chart is prepared from a table which is a continuation of a table given by Mitchell, the same basis (1890–99 average actual amounts) having been used. Number of shares sold was also made relative to the same years (cf. Mitchell, pp. 248–49, 394–95).

CHART I

STOCK SALES AND RAILROAD AND MISCELLANEOUS BOND SALES
NEW YORK STOCK EXCHANGE, 1910–25
RELATIVE AMOUNTS
(1890–99 AVERAGE ACTUAL AMOUNTS = 100)

From *Commercial and Financial Chronicle*



The years of relatively greater activity in bond sales than in stock sales were 1911, 1914, and 1921–24. In the last-mentioned period stock sales crowd closely upon bond sales upon this relative basis, and in 1925 forge ahead. In so far as 1911 and 1921 were years of depression, the statement quoted from Professor Mitchell is borne out that bond sales at such times increase while speculation in stocks declines, and in addition the evidence of 1915, 1922, and 1924 shows that with revival both bond sales and stock sales increase. Only 1922 and 1924, however, show bond sales increasing at a much faster pace than stock sales. The year 1915 does not. Even if the first six months of that year are considered, it is found that stock sales increased faster than bond sales in almost every week.[4]

The years of relatively greater stock sales than bond sales were the years 1912, 1916–17, 1919, and 1925, years commonly spoken of as years of prosperity. Though there is a decided drop in 1917 and 1918 as well as in 1920, the whole period from 1916 to 1920 may be said to have been one of relatively greater stock activity than bond activity. It must be remembered, however, that had it not been for the government financing in 1917 and 1918, activity in corporate bonds would probably have been much larger.

Three other years, which have not been mentioned specifically, require attention. The first of these is 1910. In this year, as shown by Chart I, bond sales were relatively lower than stock sales. The general trend in industry and in commodity prices had been arrested in 1909, but stock sales had continued to increase. Stock prices in some lines continued to rise until the last of the year, when stock prices and also stock sales started to decline. Bond prices were falling and interest rates rising throughout the later months of 1909, and a decline was evident in bond sales. The year 1910 was a year of reaction from the prosperity of 1909. In 1910 stock activity continued to decline, and bond prices and sales moved sympathetically, bonds rising but moderately in price, though larger in sales, in 1911.[5]

[4] An examination of weekly figures in the *Commercial and Financial Chronicle* substantiates this statement.

[5] W. C. Schluter, *The Pre-War Business Cycle*, chaps. ii, iii, iv, *passim*.

The year 1913 was a year of reaction from the prosperity of 1912. Reference to Chart I shows that in the latter year the relative increase in volume of stock sales was not great. The prevalence of high interest rates here as in 1910–11 operated to bring a decline in bond prices and bond sales. In 1913 bond sales did not increase, while the stock market struck a low point in prices in the middle of the year.[6] The uncertainty reflected on the European exchanges during late 1913 and 1914 played its part in keeping the security markets in this country relatively inactive, and the closing of the New York Stock Exchange after the outbreak of the war in Europe brought the volume for the year 1914, in both stocks and bonds, to a very low figure.

The third year which shows results differing from those of other years of depression or reaction from prosperity is 1923. This year, particularly the latter part of the year, has been spoken of by writers as a period of reaction and depression. Here bond sales fall off in amount from 1922, although they remain relatively higher than stock sales.

The amount of stock sales is always greater than the amount of bond sales, judged by the par value amount of sales in each case. The years of the highest ratios of bond sales to stock sales were 1911, 1913, 1914, 1915, 1921, and 1922. On the other hand, the tremendous activity in stocks during our war period and the post-war period is shown by such ratios of stock sales to bond sales as 36.3 for 1917, 37.7 for 1918, and 46.3 for 1919. A volume of stock sales forty-six times the volume of bond sales would seem to indicate that speculative interest had overshadowed investment interest. Investor interest did not return with strength until the crisis of 1920 had brought on a depression.

The statistical material thus far presented on bond and stock sales is based on yearly data, following the line of Professor Mitchell's presentation, and no attempt has been made to reduce this material to cycles. A more conclusive picture of the period is obtained by taking quarterly data. Chart II, covering bond sales and stock sales on the New York Stock Exchange, bank clearing inside New York City, and bank clearings

[6] *Ibid.*, chap. vi, *passim*.

outside New York City, together with commercial paper rates and the yields on fifteen railroad bonds, has been constructed, the quarterly figures having been reduced to cycles by a relative-integral derivative method.[7]

Bank clearings outside New York are used as a rough index of general business conditions. In certain points this cycle of bank clearings is probably not completely representative of general business. Particularly one notes the first three quarters of 1919, which show a definite lag of bank clearings outside New York behind those inside New York. The lag is in this case more pronounced than at former similar periods. It will be observed that if the two cycles of bank clearings were combined, a smoother curve would be obtained. This was not done, however, since it was desired to observe the influence of exchange transactions on bank clearings inside New York City.

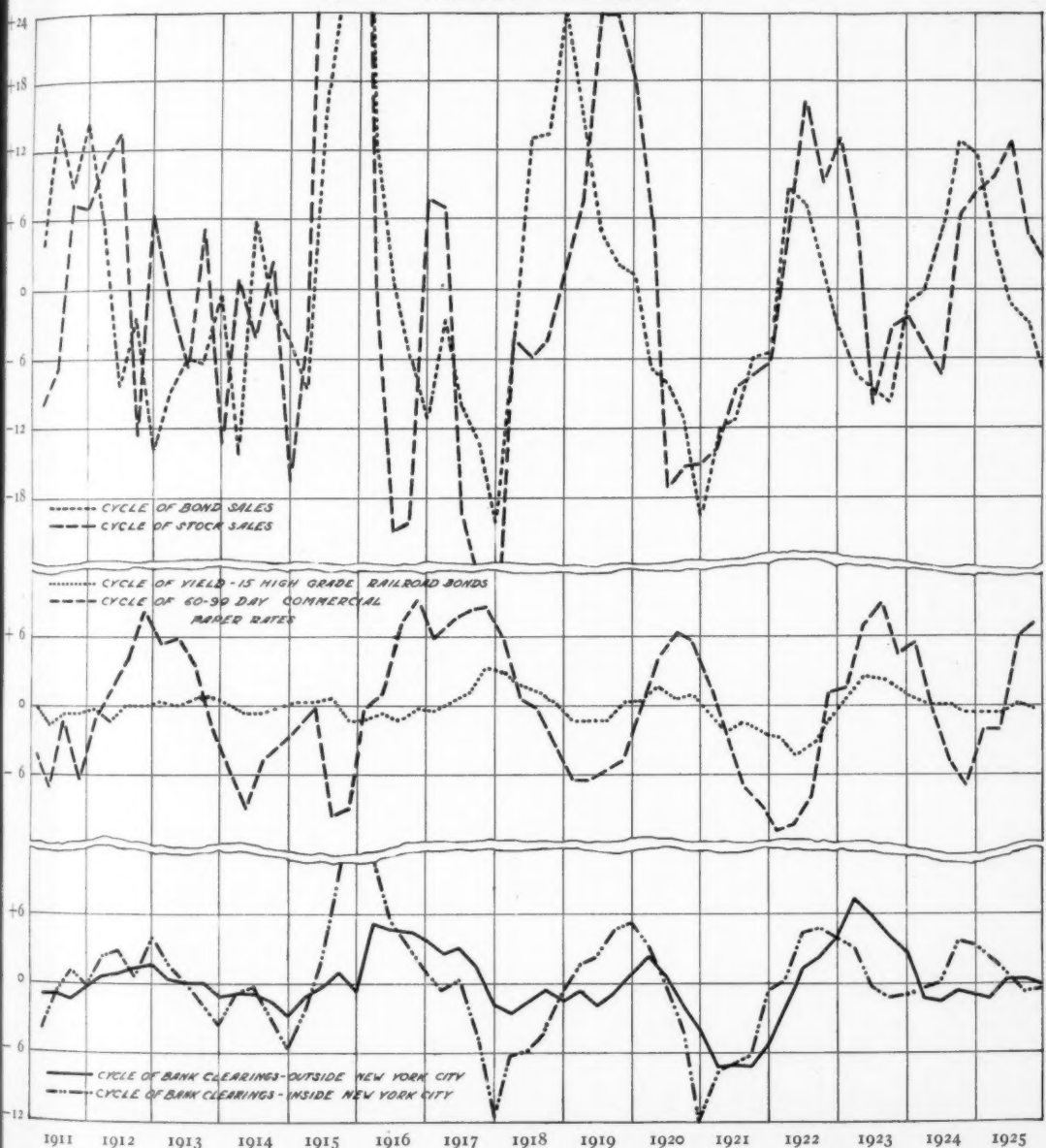
Referring to the cycles of bond sales and stock sales, it is observed that bond sales reach a peak and turn down while stock sales are yet increasing, and this bond peak comes from one to two quarters before that of stock sales is reached. In only one year, 1915, fourth quarter, did these peaks coincide. This precedence of bond-sales peaks over stock-sales peaks, combined with the fact that bond activity reaches a low point one to two quarters after the low point of stock activity, shows that in revival bond sales increase at a much more rapid pace than stock sales. Likewise it shows that stock activity falls off more precipitously before an approaching crisis, dropping from high to low in as short a period as three or four quarters. In only one year, 1917, fourth quarter, do the low points of bond and stock sales coincide.

[7] The quarterly data used were taken from the *Standard Statistical Bulletin, Annual Supplement, 1926*. The relative-integral derivative cycle method employed is that worked out by Dr. Lincoln W. Hall, of the University of Pennsylvania. The quarterly figures are integrated for four quarters, and a chain index is calculated from the successive integrals and expressed as a residual of 100, with due reference to the plus and minus signs. This removes almost all the secular trend. A three-year moving average of the residuals of respective quarters is obtained with due reference to signs, and this average obtained for each quarter is subtracted algebraically from the chain index residual for that quarter, thus eliminating the average seasonal content and any remaining secular content.

CHART II

CYCLES OF BOND SALES, STOCK SALES, INTEREST RATES, BANK CLEARINGS, RELATIVE INTEGRAL DERIVATIVE CYCLES

From *Standard Statistical Bulletin Annual Supplement*, 1926



If bond activity can be taken roughly as a gauge of investment interest in the market and stock activity of speculation, the years of heavier investment interest are seen to be 1911, 1915, 1918–19, 1922, and 1924. The years 1913 and 1914 were exceptional in that unrest both at home and abroad brought uncertainty and frequent large selling and buying on foreign account bearing no relation to American conditions. As regards the other years mentioned, there is quite general agreement with the evidence of Chart I. The war years, 1917 and 1918, are exceptions.

Quoting again from Mitchell, "Before prosperity has reached its culmination bond sales decline while stock sales continue to follow an ascending saw tooth curve. As a crisis approaches bond sales decrease rapidly while stock sales decline more slowly or even increase. During the crisis bond sales usually shrink to a small volume."[8] The cycles presented seem to bear out the first sentence of this quotation, but leave some question as to the second sentence. In every downward movement of the stock sales cycle during this period it has fallen off more rapidly than the bond-sales cycle. It would seem that during such periods some investors shift their funds from stocks to bonds. Reference to the actual weekly figures in the *Commercial and Financial Chronicle* from the month of December, 1919, to July, 1920, shows that stock sales declined more rapidly and to a greater extent than bond sales. The latter, of course, declined markedly, but recovered strength, postponing comparative inactivity into early 1921.

Further points of interest can be ascertained by comparing the cycles of interest rates with the cycles of exchange sales and clearings. The distinct lag of money-market movements behind those of investment, speculation, and business appears in the cycle of commercial paper rates.[9] This lag is one year behind that of stock sales or speculation in the case of the peaks of 1916, 1920, and 1923 as well as in the case of the succeeding

[8] Mitchell, p. 398.

[9] Quarterly averages of rates on 60–90-day choice two-name commercial paper were used.

low points. This cycle of commercial paper rates belongs to the cycles of investment, speculation, and business behind which it lags. But this is not to deny that it does have an influence on the upswing of the next cycles of bond sales and stock sales. When the cycle of commercial paper rates swings down and continues downward in response to business conditions, the chart reflects the increase, first of bond sales and then of stock sales; and when the rise of commercial paper rates becomes rapid the stock-sales cycle tends to decline rapidly.

In 1911–12, a rise in the stock-sales cycle occurs in the third quarter of 1911, while rates are yet easy, and continues in the first and second quarters of 1912; but the continued rise of the commercial-paper-rate cycle is found to correspond with a sharp decline in the stock cycle in the third quarter. The regained strength of the stock cycle in the fourth quarter of that year, and perhaps the balance of the period preceding the outbreak of war, can be explained as extraordinary for reasons mentioned elsewhere.

In the last two quarters of 1915 the high points of the bond-sales cycle and of the stock-sales cycle correspond with the low points of the commercial-paper-rate cycle, and a sharp rise of the latter in the first quarter of 1916 is accompanied by a sharp fall in the stock cycle.

Low rates in the first three quarters of 1919 are in correspondence with high points on the stock cycle, and with a sharp rise of the money cycle in the fourth quarter of 1920 occurs a fall in the stock-sales cycle.

The first two quarters of 1922 show high points on the bond-sales cycle and the stock cycle and low rates on the money cycle, and the rise of the latter in the third and fourth quarters compares with a declining tendency of the stock cycle. This is partly broken by a rise in the fourth quarter of the latter cycle, when the rate cycle continues to rise, but does not invalidate the general conclusion. At other points on the chart, for brief periods, one may find stock activity rising when rates are rising, but generally a marked increase in the latter is accompanied by a decline in the former.

The lag in bond yields is even more pronounced than that noted for commercial paper rates. In fact, the cycle of bond yields moves almost inversely to the cycle of bond sales. It is not exactly so, since the high point of the bond-sales cycle precedes the low point of bond yields (and therefore the high point of bond prices) by one quarter in case of 1918–19, 1922, and 1924, and by two quarters in 1911–12. As bond yields are falling in response to the conditions of demand for capital relative to the supply, bond prices are rising and bond sales are increasing. The cycles of bank clearings indicate that this increasing volume of bond sales occurs in periods of reaction from prosperity, in depression, or early in revival. As revival proceeds stock sales increase, speculative interest enters with increasing importance, and bond activity gives place to stock activity.

Bank clearings inside New York show the effect of exchange transactions, evincing a wider fluctuation than clearings outside New York and tending to follow stock-exchange activity fairly closely. In two years, the high of 1915 and the low of 1917, the high and low points, respectively, of New York clearings coincided with the bond and stock cycles. These were years of the widest fluctuations in the bond and stock cycles. However, there is evident at other periods a lag of from one to two quarters on the part of the New York clearings cycle behind the cycle of stock sales, which would seem to indicate that other business does affect these clearings to a varying extent, making them but partly indicative of exchange activity.

It appears, then, from the cycles studied, that movements in the investment market show the following sequence, commencing with the upswing of revival: (1) investment, as reflected by the cycle of bond sales, which of course contains some speculative element; (2) speculation as reflected by the cycle of stock sales, which of course contains some investment interest; (3) bank clearings in New York, lagging behind exchange activity; (4) bank clearings outside New York, lagging behind New York clearings and serving as a rough index of business; (5) money rates on short-time loans, lagging because of the pressure for funds to effect liquidation; (6) interest rates on

longer-time loans, reflecting the diversion of funds to short-time money markets; (7) speculation, which has reached a low point first, and, turning upward slowly, is prompted increasingly by the declining money rates, which come because of declining business and the completion of liquidation; and (8) investment activity, which is prompted by the declining condition of interest rates on long-time loans and rising bond prices. The cycle of bond activity turns up from its low point and, crossing that of stocks, comes first to a peak as noted above. Thus the movement continues.

THE FLOTATION OF NEW CORPORATE SECURITIES

The course of the investment market is further revealed by a consideration of the capital issues of corporations. Obviously they will be made at the time when it appears most advantageous to the corporation to sell the particular kind of security which it is proposed to issue. The purposes for which they are issued may vary greatly. Stocks may be issued for sale as new issues to obtain funds for expansion of equipment and plant or even to obtain working capital; or for purposes of reorganization of the financial plan of the corporation. Such may be the retirement of convertible bonds or the substitution of one type of stock issue for another. As a part of the organization of a new corporation, stocks may be issued in a bond-stock plan to offer inducement to the purchasers of the bonds. Also, stock dividends to stockholders can be spoken of as a capital issue replacing old securities. Not all of these when issued make an addition to the investment market's demand for loanable funds. Stock dividends and stock issued gratuitously do not, and stock sold far below par clearly does not, make a demand proportionate to the par value of such stocks. The replacing of old securities likewise does not make any significant impression. It is to those issues that are sold that one must look to find the demand of corporations for funds. These differing effects of stock issues have been reviewed to make it clear that the total of new stock issues does not indicate accurately the extent of corporate demand on the invest-

ment market. Since figures for new capital issues for brand new capital are not available for the entire period of 1910 to 1925, it is necessary to use listings on the New York Stock Exchange of new stock issues as an indication of this demand. This is not to state, however, that other stock operations present no indication of the investment market's condition, for obviously corporations will choose the most favorable time for replacing old securities, for example, and this time will be apt to be when other issues of stocks find a favorable market.

Bonds may be issued for sale to obtain new capital or to refund old obligations. New issues of corporate bonds are an indication of increasing investments in fixed capital, and it is this use of loanable funds in production which has its effect upon business operations. Some portion of refunding operations can be thought of as more than a transfer of one security for another, for sometimes the issue is increased. It is best, however, to use as one indication of corporate demand through bond issues the listings of new bonds, for new capital, on the New York Stock Exchange. In addition to stocks and bonds there are corporate short term notes, obligations running for a few months or for several years.

Chart III presents relative amounts of new listings on the New York Stock Exchange.[10] This includes only new corporate issues newly listed, with the exception of the years 1916 and 1917 in the report of bonds, which includes certain government issues.[11] Otherwise the data are exclusive of governmental financing, foreign or domestic. From this chart it appears that the year 1912, a year of prosperity, found the amount of listings of new corporate shares increasing markedly, both relatively and absolutely. That there was general activity in the issue of corporate shares is further shown by data on all capital stock issues of all domestic corporations. In 1912 stocks totaling $911,000,000 (par value) were issued, as against $352,000,-

[10] As reported in *Commercial and Financial Chronicle*. This is a continuation of a table presented by Mitchell, pp. 408–9.

[11] These could not be segregated.

000 in 1911. This constituted 40 per cent of all capital issues in 1912. Bonds fell off from 1911.[12]

The years 1916 and 1917 evince, with the war expansion, a decided increase in all stocks issued by domestic corporations, the total of 1916 ($781,000,000) being 240 per cent of that of 1915. Chart III shows an even greater increase in new listings, 1916 being somewhat higher than 1912, and 1917 being appreciably so.

TABLE I*

CAPITAL FLOTATIONS

(New Capital Only)

YEAR	YEARLY TOTALS MILLIONS OF DOLLARS	PERCENTAGE OF YEAR, TOTALS		
		Bonds	Stocks	Notes
1919.....	2,284	22.9	62.7	14.4
1920.....	2,565	43.	39.7	17.3
1921.....	1,701	74.7	15.9	9.4
1922.....	2,214	69.5	25.7	4.8
1923.....	2,648	69.7	24.8	5.5
1924.....	3,029	63.5	26.9	9.6
1925.....	3,607	61.9	31.8	6.3

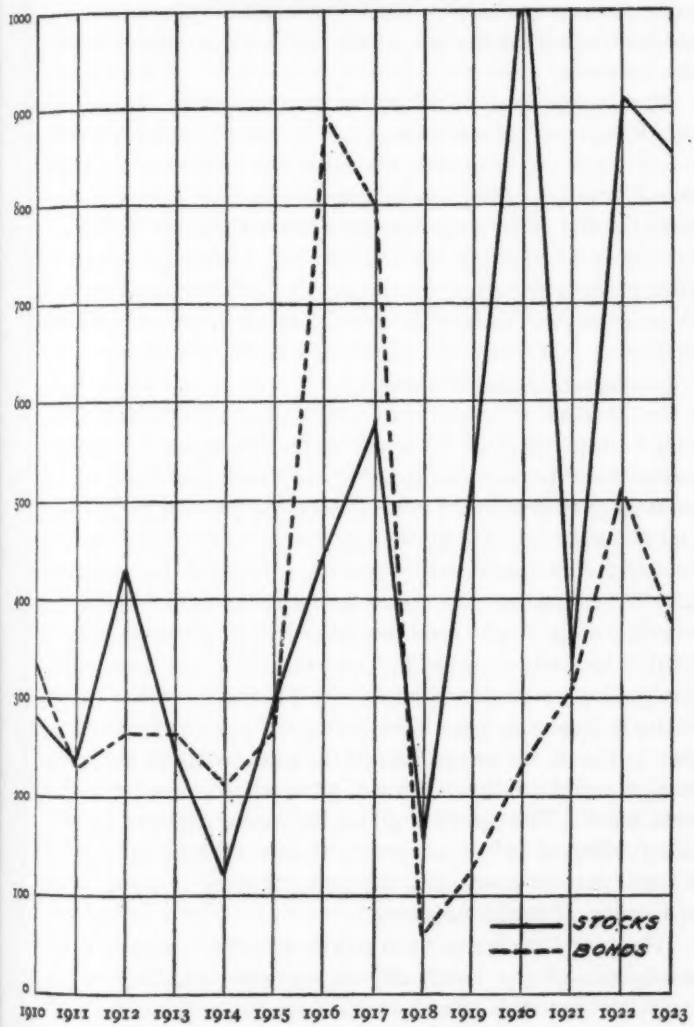
*Source, *Commercial and Financial Chronicle.*

Stocks take the center of the field also in 1919 and 1920, as shown on the chart, this being the period of marked post-war expansion in practically all lines of industry. This relative superiority of stock issues over bond issues was due to the great speculative interest which was developed in those years. While this chart would make it appear that stocks continued to be the main form of capital issue during the years subsequent to 1920, the figures of all capital issues show that from 1921 to 1924 by far the largest percentage of corporate issues of each year was in the form of bonds. Further, if only flotations for new capital are considered, as in Table I, it appears that bonds have actually and relatively been issued in larger amounts than corporate shares since 1920. The rate of interest, falling to August, 1922, and generally since April, 1923, has been significant in this development.

[12] *Statistical Abstract of United States* (1924), p. 293.

CHART III

SECURITIES NEWLY LISTED, NEW YORK STOCK EXCHANGE
RELATIVE AMOUNTS
(1890–99 AVERAGE ACTUAL AMOUNTS = 100)
From *Commercial and Financial Chronicle*



The volume of stocks issued by corporations for all purposes increases late in a period of revival and in prosperity, when the possibility of high profits serves as an appeal to investors, who at other times might demand an investment more assured of an income. Such a financial policy relieves the corporation of the burden of high fixed charges contracted at a time when interest rates are rising.

The change in financial policy of corporations in shifting from the issuance of other forms of securities to bonds is most evident in years of depression and early in revival, at times when interest rates are falling, are low, or have not yet begun to rise markedly, and when long-time financing is therefore desirable. Pressure of initial expansion in productive equipment in anticipation of an increased physical volume of business, and the desire to accomplish such expansion before prices rise too much, combine to make late depression and early revival the time for floating large issues of bonds.

In the years 1910 and 1911 there was a decline, both relatively to 1890–99 and absolutely, in the listings of new bonds on the Exchange, 1910 declining from the levels of 1909. This would seem to negate the general principle just set forth, that bond flotations increase in depression years, but it must be remembered that confidence is necessary. As will be observed later, the volume of note issues increased in 1911 over 1910, showing a desire to postpone new financing. Stock issue had declined. There was unrest in Europe. The slackened commercial activity of 1910 continued into 1911. The stock market struck bottom in August of 1911 in both range of price and volume of sales, so that in the second half of the year, owing to disturbed confidence and conditions abroad, all security issues, including notes, fell off. The figures of all capital issues, however, including refunding as well as new issues, show a substantial increase of bonds in 1911 over 1910, the total declining in 1912, when the issuance of stocks increased.

The year 1913 brought a reaction from the revival of 1912, and listings of new bonds did not increase, relatively, while stocks fell off sharply. Bond sales and bond issues both declined.

This condition of lessened activity continued into 1914 and up to the outbreak of the war in July. The stock market closed from July 31 to December 12. The general disturbed condition put a stop to corporate financing in bonds, thus causing greater temporary financing in short-term notes. Furthermore, the interest rate had increased during these two years, which itself would act to restrict or postpone some bond flotations. It is significant, however, that bonds did not fall off relatively as much as stocks, and the largest percentage of the year's capital issues was in the form of bonds.

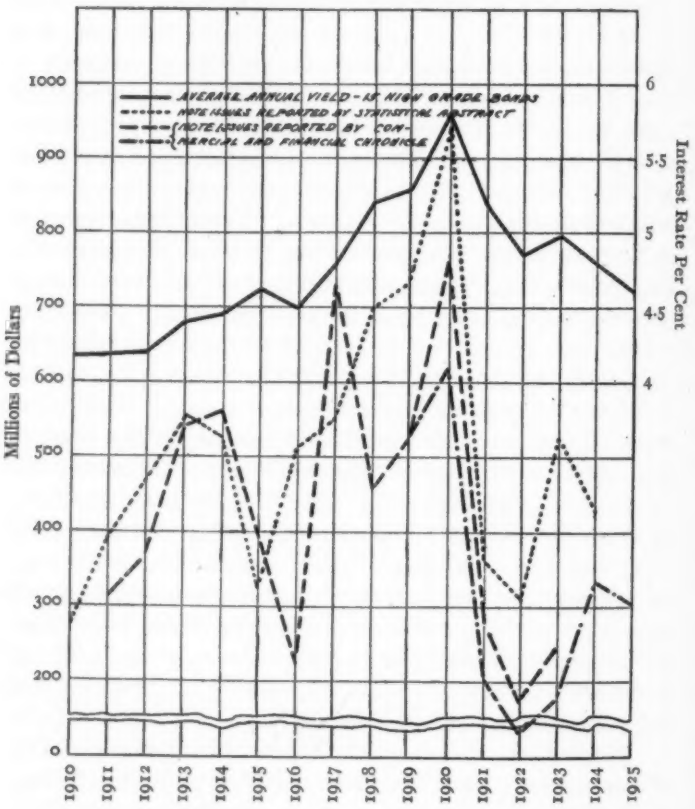
The year 1915 saw listings of new bonds equal to those of 1913 and 1912, and listings of new stocks even greater than in 1913 but not nearly as great as in 1912. The increase over 1914 on the part of stocks was greater than the increase of bonds. Including refunding issues, bonds offered for sale increased through the year to $894,000,000, the highest since 1911. Though the interest rate, as reflected by bond yields, increased during the year, there was a gradually improving credit situation, and the prospect of increasing business from Europe, as well as the accomplishment of much postponed financing of the previous two years, brought more permanent flotations. Note issues fell off in 1915 from the high point of $555,000,000 in 1913 to $327,000,000 (cf. Chart IV). Among all the listings of bonds on the New York Stock Exchange of that year, the greatest increase was in bonds for new capital, while a considerable part of the note issues was for renewals or extensions. Commercial paper rates were low, declining from 4.35 in December, 1914, to 2.98 in November, 1915. The year 1915 was a year of revival, and the bond market was relatively active.

The year 1921 was a year of depression and also one of declining interest rates. The yield of high-grade railroad bonds dropped from 6.11 in May, 1920, to 5.09 in December, 1921, continuing to fall until August, 1922, when it stood at 4.65. Listings of new bond issues increased, and total corporate bond issues struck a high point and have continued throughout the years since, including 1925, on a high level. It must be remembered that with the advent of depression large and well-estab-

lished concerns may float large bond issues retiring a large note issue of higher interest cost floated at a previous period. Such may mean substantially little increase in the actual material ap-

CHART IV

CORPORATE NOTE ISSUES, 1910–25



paratus of industry. New capital flotations in bonds, however, have shown a steady increase during this latter period, as already shown in Table I.

Turning now to corporate note issues, i.e., short-term obligations, varying generally from six months to five years in ma-

turity, one notes first the changes in volume during the period. Chart IV presents the amounts of such note issues as compiled from different sources. There is at first glance lack of agreement in the figures presented, but when one considers that there may be differences in methods of recording as to time, or differences in methods of classification as to bonds and notes, this divergence is of a little less significance. Large issues in series may be recorded as of the year when the total offering is announced, or as of the year when each series is offered for sale, or when the total flotation is known. It is impossible to get back of the material presented.[13] The only years of widely differing results are 1916 and 1918.

The years 1911 to 1914 were years of large note issues, temporary financing flourishing as never before. The considerable portion of these notes in the years 1911 and 1912 were for three-year periods or over, and while in 1913 and 1914 the number of issues for shorter periods increased somewhat, a substantial portion continued to be for three years or over.[14]

The year 1915 was one of large bond issues, as already pointed out, and note issues fell off decidedly. Such as were sold were quite diversified as to maturity, but well over one-third of the total amount of the notes was for a three-year period or over. The maturity lengthened in 1916—a majority of the items showing maturities of five years or over—indicating a longer period of short-term financing. This practice declined in 1917 and 1918, a larger percentage of shorter-term notes, for two- and three-year periods, appearing in each year. The practice common before of making short-term notes callable at the company's option was even more noticeable in these years.

Furthermore, the interest called for on these notes, while characteristically 5, 5½, or 6 in 1911, was almost uniformly 6 per cent in 1917, and in 1918, 7 per cent. Discounts which were necessary are not ascertainable from the sources consulted.

[13] *The Commercial and Financial Chronicle* does not explain the difference in classification, occasioning two different reports after 1919.

[14] Statements in regard to note issues can be verified in annual reports, in *Commercial and Financial Chronicle*, of note issues of each year.

It is interesting to note the fairly close relationship between the volume of short-term notes and the yield on high-grade bonds, the former rising as the latter rises and falling as it falls, signifying that as interest rates rise and bond prices fall off it is becoming less advantageous to finance for long periods (cf. Chart IV. This yield on bonds increased in 1913 from a monthly average of 4.25 in January (which was slightly above the average of the previous six months) to 4.50 by the close of the first half-year, and the note issues increased during this six months' period to within 10.5 per cent of the total of the previous year. Rates remained high, rising higher in the last two months, and the total of 1913 proved to be 46 per cent higher than the total of 1912. In 1915 also the first six months developed an increasing interest rate, and in that period over 80 per cent of the 1915 note issues appeared. The increasing stock and bond issues of that year caused note issues to decline in the latter part of the year, and the volume of the year 1915 fell below that of 1914.

This tendency to issue notes for comparatively short terms has its effect, however, on the banks. Such corporate securities compete in the loan market for bank funds and operate as one force, at least, to sustain the high discount rates on short-term loans which prevail in full prosperity. This demand for short-term financing helps to create tension in the money market and to bring about the lag of money rates behind the movements of business.

Professor Mitchell makes the following statement:

"Investment loans to business enterprises show a close coordination with business cycles. The amount falls off heavily in a long period of depression and increases rapidly when prosperity returns. But the figures indicate that this increase does not continue unabated until the culmination of prosperity is attained. If the actual amount (of such business loans) does not decline, at least the rate of increase shrinks from large to small proportions."[18] "Investment loans" can include both bonds and short-term notes and also bank loans for fairly long periods. No

[18] Mitchell, p. 405.

treatment of the volume of bank loans will be given. If bonds alone are considered, these conclusions are sufficiently substantiated in the period under review. In 1921, it is true, bond issues did not fall off in absolute amount, but continued to increase as in the two previous years. In contrast, however, with 1920, in which bonds for new capital increased by 110 per cent over 1919, in 1921 bonds increased by only 34 per cent over 1920. Calculation from Table I shows that there were 523 millions of new bonds in 1919, 1,103 millions in 1920, and 1,271 millions in 1921. In this year, 1921, much financing long postponed was undoubtedly being effected. The volume of note issues fell off sharply. The yield of bonds continuously declined. It was also a period favorable for funding many bank loans which had been contracted at higher interest rates. The years of peaks of actual amounts of all bond issues were 1911, 1916, 1922, and 1924. Of these the first year was one of depression and the others of revival. It appears, then, that the total of bond issues does fall off or slacken in growth at the opening of depression, and, with bond issues increasing late in depression and early in revival, bond issues do co-ordinate fairly closely with business cycles.

If corporate note issues alone were considered, it appears that these also fall off in depression. So far as the material presented in Chart IV is concerned, it can scarcely be said that there is a close co-ordination with business cycles, but some explanations can be given which may make such co-ordination clearer. In years such as 1913 and 1914, which, though years of depression, saw interest rates rising or quite uncertain, notes were employed in large quantities compared with either 1912 or 1915. Ordinarily, however, high interest rates develop in full prosperity and the peak of note issues comes at such periods.

If note issues and all bond issues for each year are combined as in Table II, such totals of "investment loans" show that marked increases occurred in 1911, 1916, 1919, 1920, and 1924, years which, with the exception of 1920, preceded the culmination of prosperity. The year 1921 shows the slackening in rate of growth that attends the period of depression.

On the upswing of the business cycle the increasing cost of

investment loans causes a shift from long- to short-term financing, awaiting conditions more favorable for long-time financing. The shift is also from bonds to stocks. For illustration of this point, Chart V has been prepared, showing the inverse relationship of bond listings as compared with stock listings in each year. This shows a shift from bonds to stocks to a slight extent in 1912, and to an appreciable extent in 1918, 1919, and 1920.

TABLE II*

VOLUME OF INVESTMENT LOANS TO CORPORATIONS

(All Issues of Bonds and Notes)

Year	Amount (Millions of Dollars)	Percentage of Increase or Decrease over Previous Year
1910	1,112	.....
1911	1,387	+24.1
1912	1,342	− 3.3
1913	1,194	−11.
1914	1,174	− 1.6
1915	1,110	− 5.4
1916	1,405	+26.5
1917	1,075	−23.5
1918	1,046	− 2.7
1919	1,424	+36.1
1920	1,949	+36.8
1921	2,179	+11.7
1922	2,318	+ 6.3
1923	2,370	+ 2.
1924	2,677	+12.9

* Source, *Statistical Abstract of United States*, 1924

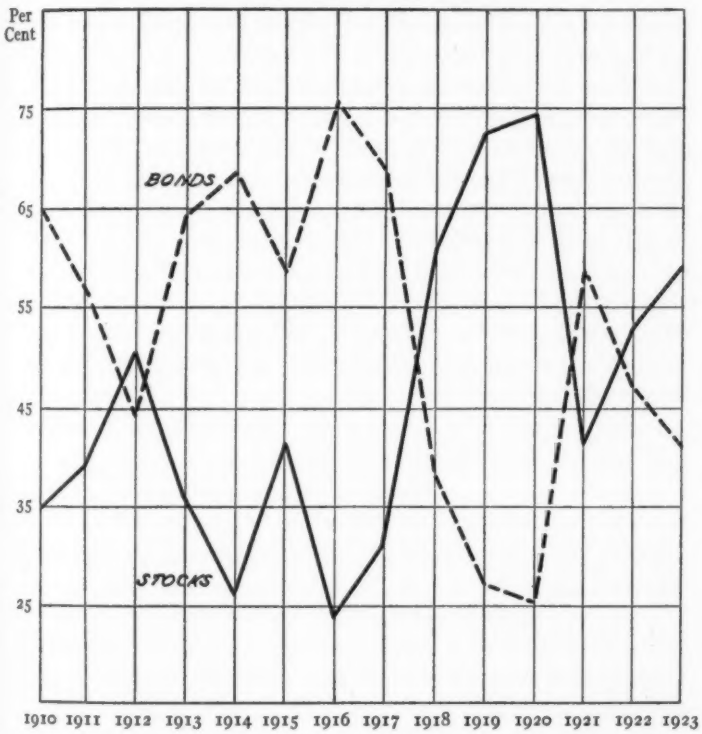
The largest proportions of the bond issues and of the note issues of 1919 and 1920 were for new capital purposes, while in the years 1921 and 1922 refunding operations, though not in any case exceeding the amount of new capital issues, did increase in relative proportions of yearly totals. These proportions for 1921 and 1922 were 28.5 and 29.9 per cent respectively, while no other year had shown more than 18 per cent for refunding purposes.

In conclusion, the material presented on capital flotations for the period 1910 to 1925 shows that the policy of corporations in general was as follows: In periods of late depression and principally in revival, capital needs were obtained largely from bond issues, the conditions of low rates, high bond prices, and gen-

erally increasing bond activity on the exchanges serving as indices of conditions favorable for long-term financing. As revival proceeded and prosperity developed, a shift occurred from bonds

CHART V

PERCENTAGE OF YEAR TOTALS OF NEWLY LISTED SECURITIES
NEW YORK STOCK EXCHANGE
(CORPORATE BONDS AND STOCKS, NEW ISSUES ONLY)
From *Commercial and Financial Chronicle*



to stock issues. There was some change from bonds to note issues, and as interest costs mounted this shift to notes became more evident, assuming its largest proportions in full prosperity. Before the peak of prosperity had been reached the stock market had usually declined, and this forced those corporations

which might have planned to issue stocks to postpone such issues until a successful flotation should be possible, in the meanwhile employing notes. Thus the succession would be bonds, stocks, notes, bonds. This would seem to correspond with the conclusion reached in the first part of this paper, namely, that the cycle runs from investment to speculation, then to higher money rates which draw forth a greater amount of note issues as business reaches a peak. It would seem that so far as the period from 1910 to 1925 is concerned, Professor Mitchell's conclusions are in a large measure sustained. With the advent of depression the volume of investment reflected in exchange sales and in new issues of bonds declines. But bond activity increases during depression and early revival as interest rates fall or remain low. The conditions of revival bring also increasing interest in stocks, and these take the center of interest, both in exchange sales and in new issues. When short-time interest rates make a sharp movement upward, stock activity decreases or its rate of increase is checked. As the crisis approaches, stock activity falls off markedly, and this appears to hold true also of new issues of stocks, corporations being compelled to depend more upon the loan market for their capital needs.

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THE ENTREPRENEUR FUNCTION IN ECONOMIC LITERATURE

In the analysis of the employer's place in production and distribution, the distinctions of practical life should serve as a guide to scientific truth. Business men have long distinguished, though in a loose and general manner, between employer and workman, between employer and capitalist, and between employer and landowner, on the one hand, and, on the other, between profit and wages, between profit and interest on a money loan, and between profit and the rent of instruments. There appears, therefore, to be ample justification for a strong presumption that these distinctions have a scientific basis. It should accordingly be the economist's first task to find that basis. A scientific analysis of the varied relations which the employer actually sustains to business would appear to be prerequisite to a scientific theory of profit. The traditional method reverses this process. From the time of Turgot and Adam Smith to the present, economists have been vainly trying to formulate a theory of profit without a definite conception of the basic function upon which such a theory must logically rest.

It is the purpose of this paper to sketch the gradual emergence and final differentiation in economic literature of the function of ownership of the business, viewed as an organized unit, as the distinctive function of the entrepreneur.

By the close of the eighteenth century, capital had come to be recognized as an essential factor of production, and occupied, in proportion to labor, a relatively more important place than hitherto in the business unit. In the absence of credit facilities, which would render the borrowing and loaning of capital easy, business was rapidly passing into the hands of the capitalists, who alone possessed the large amount of capital which for efficient production was then required for combination with land and labor in the business unit. The independent artisans, their

shops and tools now obsolescent, and, in Turgot's quaint phrase, "having nothing but their arms," had become a wage-earning class, placing their human energy at the disposal of capitalist employers, who alone could build factories and equip them with power-driven machines. The business unit was still relatively small, and was owned by capitalists, or landowners, who also organized the business and managed it as a going concern. One could scarcely expect under such conditions that economic writers of that period would differentiate the composite function of capitalist-employer, or landlord-employer, into specifically distinct economic functions, and analyze their general income into specifically distinct functional shares. The economist is dependent upon objective realities to awaken his consciousness of the idea.

Originally land ownership and the cultivation of the land were linked together. Before private property in land was recognized by law, "a man could retain the ownership of a field only in the way he had acquired it and by continuing to cultivate it," as Turgot[1] expresses it. It was private property in land that made the differentiation of the proprietor of the land from the cultivator of it—the farmer—practically possible, and the separation actually took place. The ownership of an agricultural business, which had long been united with the ownership of land, became now completely divorced from it. The rich farmer was regarded no longer as a landowner, or even, as Quesnay puts it, "as a laborer who himself tills the soil, but as an entrepreneur who manages and makes his business profitable by his intelligence and wealth."[2] Obviously Quesnay has in mind a capitalist farmer who owns and manages an agricultural business on land owned by another, and is the first economist, to the writer's knowledge, to apply the term "entrepreneur" to the independent owner of a business. The landowner is thus enabled to live without work on the "revenue"—the physiocratic *produit net*—

[1] *Reflections on the Formation and the Distribution of Riches*, translated and edited by W. J. Ashley (New York and London, 1898), p. 11, sec. 9.

[2] Grains, 1757, in *Œuvres Économiques et Philosophiques de F. Quesnay*, par Auguste Oncken (Paris, 1888), p. 219.

which the farmer turns over to him for the usance of his land. It is interesting to note that Turgot calls the landowners the "disposable class" (*classe disponible*), the only class in society

> which, not being bound by the need of subsistence to a particular labor, can be employed for the general needs of the society, such as war and the administration of justice, either by a personal service, or by the payment of a part of their revenue with which the State or the Society may engage men to discharge these functions.[3]

Turgot carries the analysis a step farther, and, for the first time perhaps in economic literature, clearly differentiates the ownership of capital as a separate economic function in business. He was enabled to do this by his conception of capital. The capitalist, as the owner of an accumulated fund of value (*valeurs accumulées*), is represented by Turgot as having to choose between two alternatives: either personally to invest his capital, or to loan it to another. If he accepts the first alternative and decides himself to invest his capital, he still has to choose between land, as a form of investment, and business. If he purchases land, he is then both capitalist and landowner. If, however, he becomes an entrepreneur, he immediately invests his capital in the different kinds of goods required for his particular business, and he is then both capitalist and entrepreneur. As capitalist he is owner of the accumulated fund of value which he, as entrepreneur, invests; and as entrepreneur he owns the specific goods in which he invests it. If, however, the capitalist accepts the other alternative and decides to loan his capital in the form of money, he remains capitalist only; for he surrenders his capital to another for investment in goods to be selected and owned by the borrower. Again, if the capitalist desires to have an income without labor on his own part he possesses, according to Turgot, two alternatives: he may either "purchase lands" or become a "lender of money." In either case he would belong to the so-called "disposable class," so far as his person is concerned. On the other hand, to quote Turgot:

> The capitalist who has become an entrepreneur either in agriculture or in industry is no more disposable—either as regards himself or his profits—

[3] *Op. cit.*, p. 15, sec. 15.

than the mere workman of these two classes; both are set apart for the carrying on of their enterprises.[4]

From this it appears that the capitalist who becomes entrepreneur is bound, like the wage-earning laborer, to "a particular labor." As entrepreneur he invests capital and employs laborers in all sorts of enterprises—agricultural, manufactural, and commercial—and is actively engaged in making his business yield him each year, "besides the interest on his capital,"

a profit to recompense him for his care, his labor, his talents and his risks, and to furnish him in addition with that wherewith he may replace the annual wear and tear of his advances,—which he is obliged to convert from the very first into effects which are susceptible of change, and which are, moreover, exposed to every kind of accident.[5]

With Turgot, then, the ownership of capital is a qualification for becoming entrepreneur, but the two functions are distinct. Turgot's entrepreneur is an employer who invests capital in a business which he owns, organizes, and manages. Turgot, however, does not place the emphasis upon the ownership of the business; for, had he done so, he would have put the entrepreneur in the "disposable class" as one who, like the landowner and the capitalist "lender of money," secures an income without labor. He expressly says the opposite of this, and seems to take business ownership as a matter of course, or as a mere incident. He does put the emphasis, rather, if the writer has correctly interpreted him, upon labor, which binds the entrepreneur, like the wage-earning workman, "to a particular labor." Turgot's entrepreneur, then, is an independent organizer and manager of a business.

It remained for Adam Smith to take the next step in the differentiation of the function of the entrepreneur. The function of the "undertaker" is, to the writer's knowledge, nowhere in the *Wealth of Nations* directly discussed; even the term rarely occurs. It is only by implication from the discussion of "profits of stock" that one is able to construct the great Scotchman's conception of the function to which profit attaches. Early in his great work, however, Adam Smith takes direct issue with the

[4] *Ibid.*, p. 91, sec. 94. [5] *Ibid.*, p. 83, sec. 87.

view, which we have described as clearly Turgot's, that organizing and directive labor is the determining element in the function with which profit is associated. He says:

> The profits of stock, it may perhaps be thought, are only a different name for the wages of a particular sort of labor, the labor of inspection and direction. They are, however, altogether different, are regulated by quite different principles, and bear no proportion to the quantity, the hardship, or the ingenuity of this supposed labor of inspection and direction.[6]

After illustrating his position he concludes as follows:

> In many great works, almost the whole labor of this kind is committed to some principal clerk. His wages properly express the value of this labor of inspection and direction. Though in settling them some regard is had commonly, not only to his labor and skill, but to the trust which is reposed in him, yet they never bear any regular proportion to the capital of which he oversees the management; and *the owner of this capital, though he is thus discharged of almost all labor,*[7] still expects that his profits should bear a regular proportion to his capital. In the price of commodities, therefore, the profits of stock constitute a component part altogether different from the wages of labor, and regulated by quite different principles.[8]

From this it is evident that Adam Smith eliminates from the function which entitles a man to profit the very element upon which Turgot had placed especial stress; and in so doing he made a distinct contribution to the cause of sound theory. Human labor logically comprises labor of every "particular sort"; and its share of the product, in logical consistency, should be called wages.

But, while clearing up the error into which Turgot had fallen, Adam Smith, unfortunately, falls into an error from which acquaintance with Turgot's analysis should have saved him. He evidently confounds production goods and capital, and consequently "profits of stock" and interest. In so doing, through the influence of his great name, he gave the cause of sound theory a serious backset. To make clear, then, Adam Smith's notion of the function which entitles a person to profit, it is necessary at this point to recall his conception of capital.

[6] *Wealth of Nations,* Vol. I, Book I, chap. vi.

[7] The italics are the writer's.

[8] *Wealth of Nations,* Vol. I, Book I, chap. vi.

In an earlier article[9] the writer has shown that Adam Smith sidetracked the Turgot capital concept, and substituted therefor a brand-new one which we may appropriately call the "Adam Smith concept." He characterizes an accumulated stock of concrete goods, exclusive of land and natural agents, from which a man expects to derive a revenue, as "capital." Only a portion of this stock of goods is represented as employed "in setting to work industrious people," and supplying them with "materials and subsistence in order to make a profit by the sale of their work." It is this portion which is pertinent to our inquiry. In representing, therefore, the ownership of "capital" as the essential element to which profit attaches, Adam Smith explicitly means the ownership of the so-called "artificial" production goods employed in a business, as distinguished from consumption goods. The very phrase "profits of stock" seemingly indicates this. Here it should be observed that in this specific point Adam Smith is in accord with Turgot. Adam Smith's failure, however, consciously to distinguish between capital and production goods rendered it impossible for him to differentiate, as Turgot had done, the ownership of capital from the ownership of a business. To him the two ownerships were essentially one, and "profits of stock" was but another name for interest.

Yet Adam Smith did, *intuitively*, recognize the accumulated fund of value invested in his accumulated stock of production goods as a distinct element, and its ownership as a distinct mode by which the individual may participate in production. He says:

> Whoever derives his revenue from a fund which is his own, must draw it either from his labor, from his stock, or from his land. The revenue derived from labor is called wages. That derived from stock, by the person who manages or employs it, is called profit. That derived from it by the person who does not employ it himself, but lends it to another, is called the interest or the use of money. It is the compensation which the borrower pays to the lender, for the profit which he has an opportunity of making by the use of the money. Part of that profit naturally belongs to the borrower, who runs the risk and takes the trouble of employing it; and part to the lender, who affords him the opportunity of making this profit. . . . . The revenue which proceeds altogether from land, is called rent, and belongs to

[9] "The Real Capital Concept," *Quarterly Journal of Economics*, XVIII, 69–74.

the landlord. The revenue of the farmer is derived partly from his labor, and partly from his stock. To him, land is only the instrument which enables him to earn the wages of this labor, and to make the profits of this stock.[10]

It is evident that Adam Smith, here, recognizes interest as "the compensation which the borrower [the employer] pays to the lender [the capitalist] for the profit which he [the employer] has an opportunity of making by the use of the money [the capital]." And, strange as it may seem, he regards interest as an important element in profit; for he says later:

It may be laid down as a maxim, that wherever a great deal can be made by the use of money, a great deal will commonly be given for the use of it; and that wherever little can be made by it, less will commonly be given for it.[11]

The logical conclusion must be that, should borrowing and loaning cease, interest would vanish, and "profits of stock" would alone remain as the share of the capitalist employer. It seems but a fair inference that, had Adam Smith made consciously the distinction between "stock" and money-to-lend, which he seemingly made intuitively, he would have grasped the capital concept of the great Frenchman, and would have distinguished, as did the latter, between capital as an accumulated fund of value, expressible in money, and the accumulated stock of concrete "artificial" production goods in which the employer invests it. He would, then, have recognized consciously that the capitalist owns and loans capital, while the employer, whether he be capitalist or borrower, owns and employs "stock" (production goods); that the capitalist, as such, is entitled to the earnings of capital, while the employer, as such, receives profit by virtue of the ownership of the buildings, machines, apparatus, and materials ("stock") in which he invests capital. He must then have recognized that profit and interest are "altogether different," and "regulated by quite different principles." The failure of Adam Smith consciously to differentiate the function of the capitalist from that of the undertaker must be attributed to the pre-

[10] *Wealth of Nations*, Vol. I, Book I, chap. vi.

[11] *Wealth of Nations*, Vol. I, Book I, chap. ix.

vailing business practice with which he was familiar. In England, at this time, the ownership of capital was prerequisite to becoming the independent head of a business; the same was true in France. Yet while Turgot stressed labor as the essential element in the function of the entrepreneur, Adam Smith, with stronger emphasis, identified that function with the ownership of "capital"; and both took the ownership of the business, as a going concern, as a matter of course.

After the publication of the *Wealth of Nations,* Adam Smith's version of the entrepreneur became traditional in England. A capitalist employer—an independent farmer, manufacturer, or merchant—conveniently poses as residuary legatee in all discussions of distribution. "Profit," or "profit of stock," becomes a sort of blanket term, which expands or contracts, as though by magic, exactly to cover the residue of the joint product after all claims against it have been met. To ascertain the amount of "profit" becomes, therefore, a simple matter of subtraction. However, when inquiry was directed toward the determination of the rate of "profit," there was difficulty. In attempting to solve this problem, Adam Smith admitted that the employer acts in different capacities; that he owns stock, that he labors, that he incurs "hazard," that he may, or may not, own the money with which the stock was purchased. It was his opinion that, in ascertaining the rate of "profit," attention must be given to all of these variable elements. Consequently there is frequent discussion among his followers as to whether this particular item, or that, should be called "profit," just as there is as to whether this particular concrete good, or that, should be called "capital." In all this discussion the fundamental importance of the ownership of the business unit is successfully camouflaged; while in the business world the development of credit facilities and the incorporation of joint-stock companies are creating distinctions in law prior to their discovery by the economists. Some fifty years after the publication of the *Wealth of Nations,* an anonymous writer in the *Quarterly Review* says:

> It is quite clear, that all the economists who have thus unwittingly comprehended under the term "profits of capital or stock," the wages of all

those very numerous classes who work, as it is said, on their own account, employing their own capital, must have wandered in a labyrinth of error and contradictions, while attempting to ascertain the laws which determine profits and wages, as distinguished from one another.[12]

The same writer also says:

It seems sufficiently obvious, that nothing can be justly reckoned profits of stock, but what can be got for it without the labor of personally applying it or superintending its application to productive purposes; because all that is got by means of this labor is *wages,* and is as properly entitled to that denomination as that which is got by any other species of labor whatever.[13]

This has the sound of a note of warning intended to remind economists of the doctrine of their great teacher; for the same writer proceeds to analyze the residue "which the economists usually speak of as 'profits of stock,' " and finds it made up of four parts, only one of which, namely, "interest of capital, or what can be got for its use without personal labor or risk," is regarded as distinctively entitled to be called "profit." He thus emphasizes the ownership of a "capital," or "stock," as the essential element in the employer's relation to business, and clearly establishes his orthodoxy. Only a few years prior to the publication of this anonymous article, Nassau William Senior, explaining the nomenclature of political economy, writes:

We have the words capital, capitalist, and profit. These terms express the instrument, the person who employs or exercises it, and his remuneration; but there is no familiar word to express the act, the conduct of which profit is the reward and which bears the same relation to profit which labor does to wages. To this conduct we have already given the name of abstinence.[14]

No further evidence is needed to show how utterly impossible it is for one who holds the Adam Smith capital concept to differentiate the capitalist function from that of the entrepreneur. This view is expressed with unmistakable clearness by Professor

[12] "The Political Economists: T. R. Malthus, J. R. McCulloch and Samuel Read," *Quarterly Review,* XLIV, 19–20. (The writer may have been either Senior or Read.)

[13] *Ibid.,* p. 19.

[14] Senior, *An Outline of the Science of Political Economy* (London, 1836), pp. 165–66.

Edgeworth, who writes, when he reaches the point, in his analysis of the parties to distribution, for distinguishing the capitalist from the entrepreneur: "To determine at what point the capitalist ends and the entrepreneur begins, appears to defy analysis."[15]

French writers generally, it may be observed, follow the example of Turgot, and emphasize the personal capacities and activities of the entrepreneur in organizing and directing the business. Even Jean Baptiste Say, who, in his *Traité d'Économie Politique,* published in 1803, became the continental interpreter of the *Wealth of Nations,* represents the personal entrepreneur as the pivot of the whole system of production and distribution, and accordingly magnifies and perpetuates the Turgot view. It seems fitting, therefore, to call the Turgot version of the entrepreneur the French version; while early German economists, it should be noted, were perhaps evenly divided in their adherence to the English and the French views of the function.

It is obvious that John Stuart Mill must have been acquainted with the French as well as with the English version of the function of the entrepreneur; yet we find in his *Principles of Political Economy,* published in 1848, no fresh analysis of the problem. He retains the classical phrase "profits of capital or stock," and describes the activities of the capitalist employer which reveal his relationship to the different elements in "profits." To Mill he is first a "capitalist"—"the person who advances the expenses of production—who, from funds in his possession, pays the wages of the laborers, or supports them during the work; who supplies the requisite buildings, materials, and tools or machines; and to whom, by the usual terms of the contract, the produce belongs, to be disposed of at his pleasure." He is also a business owner; for he "embarks in business on his own account," and "exposes his capital to some and in many cases to very great danger of partial or total loss." He is also a worker; for this same person is represented as devoting to the business "his time and labor"; as "the control of the operations of industry usually belongs to the person who supplies the whole

[15] "The Theory of Distribution," *Quarterly Journal of Economics,* XVII, 204.

or the greatest part of the funds by which they are carried on, and who, according to the ordinary arrangement, is either alone interested, or is the person most interested (at least directly), in the result." "To exercise this control with efficiency," he continues, "if the concern is large and complicated, requires great assiduity, and often, no ordinary skill. This assiduity and skill must be remunerated." Accordingly "the three parts into which profit may be considered as resolving itself, may be described respectively as interest, insurance, and wages of superintendence."[16] It was apparently Mill's intention to combine in the capitalist employer, with equally distributed emphasis, all of the functions which had hitherto been attributed to him. The ownership of the business has no especial significance to Mill, but rather seems to be taken as a mere incident of the ownership of capital. Profit, as Mill conceived it, cannot be determined by a definite law; its only unity rests in the fact that a single person receives it. It is obvious, however, that the law of interest and the law of wages are not identical. If ownership of the business unit is the distinctive element in the varied relationships which the employer sustains to business, it is certain that Mill did not make the discovery. Had he done so, he would have found that wages and interest are altogether different from profit and are, each, "regulated by quite different principles."

While Mill's version of the entrepreneur's composite function was apparently adopted by Alfred Marshall[17] and by J. Shield Nicholson,[18] among others, it is not surprising that Henry George, with blunt straightforwardness, should deny to "profit," and, by implication, to the entrepreneur, any distinctive place whatever in distribution. He says:

> Of the three parts into which profits are divided by political economists —namely, compensation for risk, wages of superintendence, and return for the use of capital—the latter falls under the term interest, which includes all the returns for the use of capital, and excludes everything else; wages of superintendence falls under the term wages, which includes all returns for

[16] Mill, *Principles of Political Economy*, Vol. I, Book II, chap. xv, sec. 1.

[17] *Principles of Economics* (4th ed.), Book VI, chapters vii and viii.

[18] *Principles of Political Economy*, Vol. I, Book II, chap. xiii.

human exertion, and excludes everything else; and compensation for risk has no place whatever, as risk is eliminated when all the transactions of a community are taken together.[19]

It may be added that Henry George expresses substantially the position taken by Roscher, who, in his *Grundlagen*,[20] avoids altogether the use of the term "profit" (*Gewinn*), and represents the entrepreneur as a managerial laborer who owns and directs the business on his own responsibility. His income, besides interest and rent, he describes as a "wage" (*Unternehmerlohn*) which constitutes no exception to the general law of wages, the only difference being that it is never the direct result of bargaining. We thus find the founder of the German historical school of political economy to be an exponent of the Turgot version of the entrepreneur.

On account of the prominence which the French version of the entrepreneur has been given by American text-writers, it seems advisable to give it more than a passing notice. To the late Francis A. Walker,[21] the entrepreneur is pre-eminently a "master," a "technical organizer," a "commander of the armies of industry." In his *Political Economy*, published in 1884, President Walker gives the following graphic description of the problems confronting the so-called "entrepreneur":

When, however, the hand-loom gives way to the power-loom; when the giant factory absorbs a thousand petty shops; when many persons, of all degrees of skill and strength, are joined in labor, all contributing to a result which perhaps not one of them understands perfectly or at all; when machinery is introduced which deals with the gauzy fabric more delicately than the human hand, and crushes stone and iron with more than the force of lightning; when costly materials require to be brought from the four quarters of the globe, and the products are distributed by the agencies of commerce through every land; when fashion enters, demanding incessant changes in form or substance to meet the caprices of the market, the master becomes a necessity of the situation. The work he is called on to perform is not alone to enforce discipline through the body of laborers thus brought under one roof; not alone to organize these parts into a whole and keep every part in its place, at its proper work; not alone to furnish technical

[19] *Progress and Poverty* (new ed.; New York, 1898), Book III, chap. i, p. 161.

[20] *Die Grundlagen der Nationaloekonomie* (11th ed.; 1874), sec. 195.

[21] *Political Economy* (New York, 1884), sections 75, 76, 209, 250–53.

skill, and exercise a general care of the vast property involved; but beyond these and far more than these, to assume the responsibilities of production, to decide what shall be made, after what patterns, in what quantities, and at what times; to whom the product shall be sold, at what prices, and on what terms of payment.[22]

The problems here so vividly described are clearly problems of organization and direction. They make their appeal for the highest types of economic labor. President Walker is at least logical in describing the nature of the function to which, in his judgment, profit attaches, before he discusses profit as a separate share in distribution. He has really given us, however, a classification of the workers in modern industry into two groups, which separate the organizing and directive laborers from those who are organized and directed. Those in one group are called "entrepreneurs," and receive "profit"; while those in the other are "laborers" merely, and receive "wages." Walker's so-called theory of profit, then, proves to be in reality a theory of wages for managerial laborers; while his theory of wages applies to the laborers in the other group. It may be added that either theory would serve equally well to explain the shares of the members of the other group. Accordingly, Walker has virtually given us what would appear to be two interchangeable theories of wages. A discussion of these theories does not come within the scope of this paper; they are here mentioned merely to emphasize the fact that organizing and directive labor cannot be made a distinctive function by giving it a distinctive name. The writer would not be understood, however, as at all minimizing the tremendous importance of organizing and directive labor in modern industry. Organization naturally implies a distinction between the organizer and the organized, between directive and directed labor; and each is perhaps equally essential to the other. But it is believed that economic labor logically includes all human labor in industry, and that its share of the joint product should be called wages. It is further the writer's judgment that clearness of analysis would be served by the conscious recognition by economists of this fact. It should be noted, also, that the func-

[22] *Ibid.*, sec. 76, pp. 60, 61.

tion of ownership of the business unit receives no attention in President Walker's analysis.

Among the American exponents[23] of the French version of the entrepreneur mention should be made of Professors Seager and Fetter, who, like President Walker, characterize the so-called "entrepreneur" as an organizing and directive laborer. Unlike the latter, however, these writers comprise under the term profit elements which cannot properly be ascribed to labor.

Professor Seager writes:

> Foremost among the world's workers are the *so-called captains of industry* or *entrepreneurs* who direct industrial processes. Their remuneration comes to them as profits or balances left over from the sale of products after all the expenses of production have been paid.[24]

He then differentiates "profits" into three portions,[25] namely, first, "wages of management," which "are governed by the same law that controls wages generally and that for this reason require no separate treatment"; second, "net or competitive profits," which are directly ascribed to the frequent changes occurring in actual industrial society; and third, "monopoly profits," which exist "when one firm or a combination of firms secures such a control over the supply that it may regulate the price." From this it appears that the function of directive labor—his so-called "entrepreneur" function—entitles the "captain of industry" to wages; while some other function, not specifically emphasized, but at least recognized, entitles his "entrepreneur" to profit.

Professor Fetter,[26] on the other hand, describes the "enterprizer" as "the man who gives his name and energies to the launching and guiding of a business," and then explicitly states with all the emphasis of a paragraph heading: "Typical economic profits are thus a species of wages but are marked by peculiar features."[27] He closes his discussion with the state-

[23] To this group belong Ely, Seligman, Irving Fisher, and more recently Bye, Fairchild, Furniss, and Buck.

[24] *Introduction to Economics* (3d ed.; New York, 1906), p. 55.

[25] *Ibid.*, chapters x and xi.

[26] *The Principles of Economics* (New York, 1904).

[27] *Ibid.*, p. 284.

ment: "Profits are the share, or income, of the enterprizer for his skill in directing industry and in assuming the risks. Despite the complex influences, they are determined by his contribution to industry essentially as is the value of any skilled service."[28] According to Professor Fetter's express statement, therefore, the "enterprizer function" and "profits," as he conceives them, are not logically entitled to a distinctive and co-ordinate place in production and distribution. In a later chapter,[29] however, another sort of "profits," what he calls "monopoly profits," is described. Professor Fetter here shifts his emphasis, perhaps unconsciously; but he explicitly states that the "profits of monopoly" "appear to be due not to the services of the enterprizer in increasing production, but to his success in limiting it"—a limitation born of "ownership and control." Here, there appears to be an unconscious reference[30] to a distinctive economic function, and to a distinctive share in distribution.

In the contention that "organizing and directive labor" is labor and, therefore, does not constitute an adequate basis on which to construct a theory of profit, the writer finds himself in accord with a decided trend in current opinion. Professor Taussig, in answer to the question, "Where do business profits cease and mere wages begin?" says:

> Probably the best plan for the exposition of distribution at large is to follow the tradition of describing all reward for exertion as wages. . . . . Certainly for most purposes of classification, we should not be consistent if we drew the line between wages and not wages according to the bare independence of the workmen. The cobbler who works alone in his petty shop gets in the main a return for labor as much as the workman in the shoe factory.[31]

Professor Taussig goes on to make a distinction of great *practical* moment, when he says:

> The independent worker gets a primary and not a derivative share of the total income of society . . . . he is dependent on no fixed bargain for

[28] *Ibid.*, p. 291. [29] *Ibid.*, chap. xxxiii.

[30] It should be noted that Professor Fetter in his later work, *Economic Principles* (1916), attaches more importance to ownership as an element in the enterprizer's function.

[31] "The Employer's Place in Distribution," *Quarterly Journal of Economics*, X, 86.

the money income which will serve him to procure a share in society's real income of consumable goods. Herein his situation differs essentially from that of the hired laborer. . . . . The hired laborer gets his money income as the result of a bargain by which he sells his working power for a space. The independent workman gets his money income directly from the sale of what he makes.[32]

It should be kept in mind, however, that the present article is written from a theoretical point of view. In economic distribution bargaining and contract have no place. For us the primary question, therefore, is not, What does the laborer actually get? but, rather, What is the product of his labor? and what is he economically entitled to? According to this view, the independent laborer and the hired workman stand on the same footing. Professor Carver expresses his position as follows: "If wages are the earnings of all labor, they must, of course, include the earnings of the independent worker, whether he runs a small shop where he works alone, or a large establishment where hundreds are working for stipulated wages under him."[33] Professor John Bates Clark explicitly says of the function of the entrepreneur: "The function in itself includes no working."[34] Professor Flux says: "The distributive share known as profits, then, has, in practice, had the remuneration of the services of management cut out of it."[35] It would seem scarcely necessary to multiply illustrations. The general trend of economic opinion had been indicated.

Professor Mithoff[36] justly claims for German economists the credit for inaugurating the movement to differentiate entrepreneur's profit as a distinctive functional share in distribution. The earliest suggestion of such a differentiation is credited to Hufeland,[37] 1807; a fuller expression of it to Riedel,[38] 1839, and

[32] *Ibid.*, p. 87. [33] *The Distribution of Wealth* (New York, 1904), p. 259.

[34] *The Distribution of Wealth* (New York, 1899), p. 33; "Insurance and Business Profits," *Quarterly Journal of Economics*, VII, 40–54.

[35] *Economic Principles* (London, 1904), p. 156.

[36] "Die Volkswirthschaftliche Vertheilung," in *Schoenberg's Handbuch der Politischen Oekonomie* (2d ed.; 1888), I, 674.

the money income which will serve him to procure a share in society's real

[37] *Neue Grundlage der Staatswirthschaftskunst* (1807), I, 290.

[38] *Nationaloekonomie*, 2 vols. (1839), sections 466–77, 685–98.

von Thünen,[39] 1842; and its complete accomplishment to Mangoldt, who, in 1855, published his *Die Lehre vom Unternehmergewinn,* which deserves recognition as a landmark in the movement. Mangoldt's conception of the function of the entrepreneur is, therefore, of great importance in our inquiry.

Mangoldt makes it clear, at the outset, that his investigation is concerned only with businesses which produce for the market (*Verkehrsgeschaefte*). He explains that a business of this sort necessarily involves more or less uncertainty of success, and that the responsibility for its success or failure rests upon its owner. Such a business he calls an enterprise (*Unternehmung*), and to its responsible owner he applies the term "entrepreneur" (*Unternehmer*). The entrepreneur is, accordingly, the responsible owner of an enterprise. He explains, at considerable length, that the ownership of capital is not essential to the conception. Further, in a criticism of the views of Hermann and Riedel, Mangoldt takes exception to the proposition that certain kinds of labor—organizing and directive labor—are inseparable from the conception of the entrepreneur, and expresses himself as follows: "All that is inseparable from the conception of the entrepreneur is, on the one hand, the mere receiving of the product of the enterprise, and, on the other, the responsibility for whatever losses occur."[40] This is perhaps what Professor Clark means when he speaks of the entrepreneur as one "who simply extends the aegis of his civil rights over the elements of a product and then withdraws it, in order that the product may pass into other hands. The *entrepreneur* or *assumer* is he who takes upon himself the responsibility of ownership."[41] Mangoldt evidently places the emphasis upon the element which, to the present writer, is the distinctive function of the entrepreneur; and yet he was not able to differentiate it altogether from organizing and directive labor and capital-owning. This inconsistency is not revealed until he turns to the analysis of the several elements of profit which the entrepreneur receives as his share.

[39] *Der Isolirte Staat,* Vol. II, Part I, sec. 7, pp. 80–86.

[40] *Die Lehre vom Unternehmergewinn,* pp. 43–44.

[41] "Profits under Modern Conditions," *Political Science Quarterly,* II, 607.

Here it becomes evident that the function of responsible ownership does not serve, solely, as the basis of profit. If one were to construct Mangoldt's conception of the entrepreneur function, by the implications involved in the elements of profit ascribed to it, the function would obviously comprise, besides the responsible ownership of the business, a modicum of organizing and directive labor, as well as of capital-owning. Yet Mangoldt, in giving us the conception of the responsible ownership of the business as the distinctive function of the entrepreneur, and in emphasizing its importance as a basis for profit, in the writer's judgment, made a notable contribution to the cause of sound theory. After the publication of his monograph, economists could no longer consider the function as a mere incident to some other function, or ignore it altogether, as had been the case hitherto. On the contrary, many economists have come to recognize the responsible ownership of the business unit as the predominant element, if not the only one, in the function of the entrepreneur—notably Mithoff and Cohn, in Germany, and John Bates Clark, F. M. Taylor, and A. S. Johnson in America; while others, still clinging to a broader view of the function, give this specific element unmistakable recognition.

To Professor John Bates Clark, pre-eminently, belongs the credit for giving the function of the entrepreneur, as a distinctive function, a permanent place in economic theory. He views the problem of distribution as "primarily functional rather than personal." Accordingly, he conceives of a person's income as composed of "the incomes attaching to the functions he performs." Professor Clark, therefore, considered it essential, in working out his theory of distribution, to distinguish clearly between the different functions through which men draw an income from the product of socialized industry. Unfortunately, however, in his earlier writing he employed the term "entrepreneur" in the broad sense of an employer who organizes and directs a business which he personally owns. Accordingly, his entrepreneur is at this time a person of several functions, which, to be sure, are carefully distinguished. Upon one function, that of the ownership of the business, he places unmistakable emphasis as the dis-

tinctive one; for he says: "Pure profit is the return of simple ownership. It is free from all admixture of wages and interest."[42] Here he clearly connects the distinctive share with the distinctive function; but he fails to restrict specifically the personal entrepreneur, as such, to the performance of the distinctive function. This defect in his analysis, however, he remedies in an article published six years later. Here Professor Clark uses the term entrepreneur, as he says:

> in the unusually strict sense, to designate the man who co-ordinates labor and capital, without in his own proper capacity furnishing either of them. . . . . In performing this one function he contributes to industry nothing but relations. . . . . He connects labor and capital with each other in his own establishment.[43]

Here, it should be observed, Professor Clark restricts the personal entrepreneur, as such, to the performance of a distinctive function; but he describes the specific function in terms not used before. It is now characterized, not as "simple business ownership," but as the "co-ordination of labor and capital" in a business. The question naturally arises whether Professor Clark is here describing a different function as that of the entrepreneur, or is characterizing the "function of simple business ownership" in different and perhaps more analytical terms. It is the writer's judgment that the latter is the correct answer; but he recognizes that the terms are susceptible of an entirely different construction. This striking characterization of the entrepreneur's function as that of "co-ordination of the factors of production" appears again, after an interval of seven years, in Professor Clark's volume *The Distribution of Wealth*. In this work, which contains his complete theory, published in 1899, Professor Clark describes the entrepreneur's function as "purely co-ordinating work," and adds: "The function in itself includes no working and no owning of capital; it consists entirely in the establishing and maintaining of efficient relations between the agents of production."[44] And finally in Professor Clark's latest work, *Essen-*

[42] "Profits under Modern Conditions," *Political Science Quarterly*, II, 606.

[43] "Insurance and Business Profits," *Quarterly Journal of Economics*, VI, 45–46.

[44] Page 3.

tials of Economic Theory (1907), the entrepreneur's function is again described as "a special co-ordinating function which is not labor," "but is essential for rendering labor and capital productive." After stating that the "function is quite distinct from the work of the superintendent or manager of a business," he speaks of it as "the function of hiring both labor and capital and getting whatever their joint product is worth above the cost of the elements which enter into it."[45]

It is true that we commonly speak of the business owner, as such, as hiring both labor and capital, as placing labor and capital in effective relations to each other, and as doing everything in fact that is done; and yet he does no work. However, there is no doubt that the "co-ordination of the factors of production" calls for labor of the highest type—that of organization and direction. All that the entrepreneur, in his true capacity, does is to choose and hire the organizing and directive worker, who creates the organized business unit by placing the factors of production in effective relations to each other, and directs it as a going concern—and all in the name of the entrepreneur who owns it. This is also Professor Clark's view, as he clearly shows in his illustration of "how a man can be an entrepreneur only."[46] A. S. Johnson, who was evidently influenced by Professor Clark's analysis, confirms the writer's interpretation. He speaks of the entrepreneur as "the man who performs the function of combining labor and capital for the exploitation of an opportunity," and then adds, by way of explaining his connection with the business: "He lends it his name, he assumes legal responsibility for the conduct of the business, and he reserves to himself the ultimate power of approving or vetoing proposals made by his staff. These are the only functions that the enterpriser must necessarily retain."[47] All of these matters are obviously involved in the function of business ownership. With this view Professor F. M. Taylor is seemingly in accord, when he writes: "The peculiar func-

[45] Page 85.

[46] John Bates Clark, *Essentials of Economic Theory* (1907), p. 86.

[47] *Introduction to Economics* (rev. ed.; Boston, 1922), p. 283.

tion of the entrepreneur must surely be found in something which he only can do."[48]

The student of economic theory can but regret Professor Clark's failure to retain in all his writing his earliest characterization of the entrepreneur's specific function as that of "simple business ownership." The function, thus characterized, clearly involves no labor, no capital-owning, and no land-owning, and is the distinctive function to which profit attaches.

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[48] *Principles of Economics* (5th ed.; Ann Arbor, 1918), p. 462.

INDUSTRIAL RELATIONS IN THE POTTERY INDUSTRY

Pottery presents an interesting example of the extent to which co-operation between the union and the association can be carried in a protected, well-knit, semi-monopolistic industry so long as changes in neither price, tariff, nor technology alter the situation. Relations between the workers and the employers in the pottery industry had been exceptionally peaceful until 1922. Co-operation was secured through a system of collective bargaining between the union, the National Brotherhood of Operative Potters, and the two manufacturers' associations, the United States Potters' Association and the Sanitary Potters' Association. Over a period of twenty-two years the pottery operators were without a single serious stoppage, and the peaceful co-operation that existed in the industry was marked. Then in 1922 strikes in the two major branches of the industry disrupted the industrial situation and did much to destroy the benefits that had arisen from the harmonious relations that had existed between worker and owner until that time.

It is necessary to understand in general the nature of the pottery industry and the method of making pottery products.

THE MANUFACTURE OF POTTERY

The following table gives a fairly clear picture of the size of the pottery industry. The industry is evidently of small size, and also of small scale. The typical plant employed from 100 to 250 workers.[1] Furthermore, 40 per cent of the product, by value, is made in plants whose total value product is between $100,000 and $500,000 per year (see Table I).

The principle materials used in the production of pottery goods are kaolin, ball clay, flint, and feldspar. These substances are weighed and mixed in the blunger mill with the proper proportion of water. To secure even consistency and correct char-

[1] *Fourteenth Census of the United States* (1920), X, 806.

acteristics this raw mass is worked in filter presses and pugg mills.[2] The body or shape of the ware is then formed, either by jiggering, by pressing, or by casting. The next step is the firing of the ware in a kiln where it is heated to a high temperature. The result is a porous body which is hard and brittle. This body is dipped in a glaze and fired once more. Now when removed from the kiln the ware has a hard, glossy, impervious cover over the porous body.

TABLE I

GENERAL STATISTICS OF THE POTTERY INDUSTRY FOR 1914 AND 1923*

	1914	1923
Number of establishments	350	304
Number of wage-earners	26,705	36,824
Value of product	$36,924,606	$114,392,033
Value added by manufacturing	$24,011,050	$ 80,792,148

* "Clay Products Industries," *Census of Manufactures* (1923), p. 23.

The production of pottery is still largely hand work, requiring many skilled artisans. Particularly is this true in the production of general ware products. Reference to Table I shows that in 1923 about 71 per cent of the value product was value added in the manufacturing process. In an industry where there is as yet little place for machinery, the greater portion of this value added cost must represent wage expense. The skilled worker has a vital position in production except in places where the casting method has been adopted. Consequently there is found in the industry a number of skilled trades. These include the slipmakers, the jiggermen, the pressers, the kilnmen, the dippers, and the decorators.[3] Apprenticeship rules in force have established a three-year training period as a preliminary requisite to becoming a journeyman jigger or presser. The other trades have shorter training periods.

The nature of the work, the skill involved, the working conditions, and trade risks—all these elements have had their effect

[2] *Pottery Industry*, Department of Commerce Misc. Series No. 21, pp. 137–66.

[3] *A Survey and Analysis of the Pottery Industry*, Federal Board of Vocational Education Bulletin 67, 1921.

in determining the character of the workers. In the early history of the industry many English potters came to this country. These men formed the nucleus for the body of American workers. They brought with them the customs and traditions of their crafts. So there developed in this country a body of trade practices relating to method of payment, length of working day, quantity of work to be finished in a day, and hiring of helpers. Our dependence on England for skilled potters practically ceased by 1900. By that time, however, the unions had adopted strong apprenticeship rules and had power enough to maintain control of the working force. Hence we see the pottery workers as a skilled group who are desirous of retaining their trade practices, who are opposed to change and innovation, who are stable and conservative in nature, and who have in their skill a big factor in determining bargaining power. The result has been the development of a strong union, the National Brotherhood of Operative Potters, which includes in its locals all the skilled workers, many of the semi-skilled, and a few of the unskilled.

Among the manufacturers of pottery there exist two definite groups: producers of general ware and producers of sanitary ware. This grouping is based on nature of product, similarity of interests, and character of production problems. Corresponding to this division there existed two manufacturers' associations: the United States Potters' Association, with headquarters at East Liverpool, Ohio, and the Sanitary Potters' Association, with headquarters at Trenton, New Jersey. The sanitary association was disbanded in 1923. The general ware manufacturers produce earthenware or white ware, common colored ware, and porcelain and china. The sanitary ware manufacturers produce goods such as washstands, bathtubs, lavatories, and drinking fountains. The relative importance of these groups of products is indicated in the table on the next page.

It is seen that white ware and sanitary ware are the two most important groups of products. Electrical porcelain supplies are also made in large quantities. However, these insulators are made in plants where collective bargaining does not function.

Here we have, then, the two parties to the collective bar-

gaining process: the union of workers on the one hand, and the two associations of employers on the other. In order fully to understand the course which industrial relations have taken in this industry, it is necessary to get a picture of the economic situation surrounding the production of pottery products.

ECONOMIC FACTORS AFFECTING THE MANUFACTURE OF POTTERY

Among the conditions affecting the manufacture of pottery there stand out six economic factors as being of predominant

TABLE II

POTTERY PRODUCTS BY CLASS AND VALUE FOR THE YEAR 1923*

Class	Value	Percentage of Total
Colored clay ware	$ 8,000,000	7.0
White ware	39,000,000	33.9
Sanitary ware	28,000,000	24.3
Porcelain	2,000,000	1.7
Hotel china	10,000,000	8.7
Electrical supplies	21,000,000	18.3
Others	7,000,000	6.1
Total	$115,000,000	100.0

* "The Clay Products Industries," *Census of Manufactures* (1923), p. 24.

importance. These are (1) the importance of labor in the manufacturing process, (2) the extent to which localization has taken place, (3) the absence of seasonality, (4) the influence of the tariff, (5) the domestic competitive situation, (6) technological changes.

The manufacture of pottery, in contrast with the manufacture of iron and steel products, for instance, requires an exceptionally high proportion of labor. This is still true despite the gradual change in process which has been taking place. Thus, at the beginning of the war, the last date at which cost figures were published, the labor cost of manufacturing white ware amounted to 58.8 per cent of the total cost.[4] Today, the labor cost of making this type of goods remains above 50 per cent of the total cost.[5] When the industry as a whole is considered, the

[4] *The Pottery Industry*, Department of Commerce Misc. Series No. 21, p. 37.

[5] Statement by Mr. Burgess, tariff expert for the United States Potters' Association.

proportionate importance of labor cost falls somewhat because in the production of sanitary ware greater development of the casting method has taken place. In addition to the importance of labor as an item of cost is the fact also that the majority of the operations in pottery are skilled in nature, such as jiggering, pressing, and kiln-placing. Consequently the worker is an extremely important factor in the productive process, and the union which controls the worker is in a position to demand and secure recognition and co-operation from the producers.

In the second place, pottery is localized in Ohio and New Jersey.[6] In 1923, 33 per cent of all pottery produced was made

TABLE III

PERCENTAGE OF TOTAL PRODUCTION OF EARTHENWARE AND SANITARY WARE PRODUCED IN OHIO AND NEW JERSEY

State	Earthenware (Percentage)	Sanitary Ware (Percentage)
Ohio	64	13
New Jersey	3	49

in Ohio, while 20 per cent was made in New Jersey.[7] Furthermore, the centers of location seem to be East Liverpool and Trenton; East Liverpool for the white ware trade and Trenton for the sanitary trade. This is shown in Table III.

This condition is of basic importance in the industry, from the standpoint both of the men employed and of the manufacturers. It has meant the establishment of centers where large bodies of workers have been afforded a constant opportunity for discussion of problems and for working out of policies. Thus has developed the strong potters' union. It has meant that the manufacturers have had more ready contacts provided, facilitating the organization of firm associations.

The industry is without seasonal fluctuation.[8] In 1914 the minimum number employed was 93.6 per cent of the maximum,

[6] R. H. Whitbeck, "Specialization in Industry," *Journal of Geography*, October, 1909, pp. 34–41.

[7] *Census of Manufactures* (1923), "Pottery," p. 24.

[8] "Clay Products Industries," *Census of Manufactures* (1923), p. 22.

while in 1923 it was 87.5 per cent of the maximum. Hence pottery is an industry in which the worker is freed from the problems of seasonal production.

We turn to a consideration, now, of the factors which have been more active in their effect on labor relations and collective bargaining. These include the tariff, the domestic competitive situation, and the introduction of new processes.

The competition which the industry experiences from foreign producers is the resultant of a group of factors.[9] The outstanding elements appear to be manufacturing costs of foreign producers, transportation and packing costs, tariff rates, and quality of goods. The tariff holds the position of predominant importance, and the maintenance of tariff rates is necessary for the continued prosperity of the industry.

At the present time no manufacturing costs of a comparative nature are available. However, comparisons based on wage scales and raw material prices indicate that costs of American producers are in some cases 100 per cent higher than costs of producers in England, Germany, France, Austria, and Japan.[10] Since packing and transportation do not increase the cost of the article by more than 20 per cent,[11] tariff protection is extremely important to the domestic producer. The tariff is the key to the situation. With duties of from 30 to 70 per cent ad valorem the needed protection is secured.[12] The result is that pottery in the United States presents the picture of a protected, sheltered industry. Pottery has been very susceptible to tariff changes in the past. Cuts in duties in 1894 and in 1913 had immediate effect in decreasing domestic output and in disrupting industrial relations. Such evidence but supports the importance of the tariff and the protected nature of the industry.

The principal factor affecting the domestic competitive situation has been the existence of manufacturers' associations.

[9] *Pottery Industry*, U.S. Tariff Commission, Information Series.

[10] *Ibid.* See also *The Pottery Industry*, Department of Commerce, p. 48.

[11] *Pottery Industry*, Tariff Information Series, p. 12.

[12] United States Tariff Commission, *Dictionary of Tariff Information* (1924), pp. 118, 289.

Until 1923 two associations were functioning, the United States Potters' Association and the Sanitary Potters' Association. Since that date but one has continued.

The United States Potters' Association is a group of pottery manufacturers engaged in producing general ware goods such as earthenware, Rockingham ware, china, porcelain, and hotel ware. It controlls 99.9 per cent of the production of hotel china, 64 per cent of the production of china and porcelain, and about 80 per cent of the production of white ware.[13] Its activities have extended over a period of twenty years. It has committees on labor relations, research, manufacturers' cost, art and design, kiln and fuel production, transportation, and machinery. The labor committee, through its conferences with the union, sets uniform wage prices and seeks to maintain a uniform wage scale and working conditions. This does not mean that labor costs are standardized, for the industry is on a piece-rate basis; but the tendency is in that direction, for the traditions and practices which have grown up in the industry and which are maintained by the union tend to set the amount of work which each union member does each day. The committee on costs, kiln and fuel, and machinery make available the best information on those subjects. The research committee secures for the benefit of all the results of investigation into new material combinations and new processes. The transportation committee is continually endeavoring to secure more favorable freight rates. Finally, the statistics committee collects production information for the use of the membership. Hence, on the basis of length of activity, character of activity, and degree of control in the industry, there is decided indication of the presence of harmonious relations between producers. This fact is of great importance in estimating the ability of the employers to cope with the union. There is no evidence, however, which indicates any practices in restraint of trade.

The Sanitary Potters' Association included in its membership only makers of sanitary ware. It was disbanded in 1923 as

[13] *Proceedings of the Forty-sixth Annual Convention of the U.S. Potters' Association.* 1924.

the result of government suit. At that time the association directly controlled 82 per cent of the production of sanitary ware in the country. This association, also, had had a period of long activity, its formation having occurred before 1900. Until 1923 its activities had not been questioned. Co-operation on the problems of labor relations, transportation, and manufacturing had formed the field of its major interests. Finally, the Lockwood Committee, in investigating the building trades, unearthed information which indicated the presence of illegal practices. Consequently the government instituted suit in March, 1923, in the city of New York against twenty-three corporations and twenty-four individuals engaged in the production of sanitary ware. They were charged in general with violations of the criminal provisions of the Sherman law. Specifically they were charged with restricting output to maintain high prices, with fixing prices, with keeping all inferior goods or "seconds" out of the domestic market in order to exact top prices, and with maintaining a blacklist of jobbers.

The defendants said that they were guilty of but two minor offenses, namely, setting list prices and fixing the terms of the sale. Since neither of these practices amounted to fixing prices, discounts being first deductable, they pleaded not guilty to the major indictments. The defendants pleaded ignorance as the excuse for the minor offenses. Nevertheless, twenty-three companies and twenty individuals were convicted by the jury, with penalties totaling $170,000 in fines and from one to ten months in jail. The case was appealed, and the New York Circuit Court of Appeals and Errors reversed the decision of the lower court. The government carried the case to the Supreme Court of the United States, where it now rests.

Whether or not the association was guilty of practices in restraint of trade is not of such great moment from the standpoint of industrial relations. The important thing to note is that harmonious relations among the sanitary manufacturers did exist for a long time and to a high degree; that this co-operation took the form of a definite organization which determined common policies; and that thus one body existed which could speak au-

thoritatively for the manufacturers in setting wage rates and working conditions with the union.

In the last decade and a half there have been some developments in the technique of making pottery that have a very important bearing on the industrial-relations situation. The culmination of the experiments in the casting process of forming ware and the success of the introduction of this method into the plant during the last few years have particular significance.

Before the introduction of casting, all ware was formed by pressing, turning, or jiggering. These methods were largely hand processes requiring a great amount of skill. Casting secures the formation of the clay body without the need of any skill. In truth, it is only since the war that the full importance and usefulness of the casting process have been known, and it was not until the strike of 1922 that the workers grasped its import. In products of a certain type the casting method eliminates the element of skill entirely. The clay body is made up in liquid form and is poured into plaster of Paris molds. Plaster of Paris being of an highly absorbent nature, the mold soaks up the water of the clay mixture, leaving in the mold the plastic clay in the desired shape. After standing for a short time the mold is removed. All that is required of the workers is to pour the clay into the molds and to remove the article from the mold after it has dried. Some goods are cast in more than one piece, and these have to be assembled, an operation that can be mastered in a short time. In three weeks green hands have been able to make more pieces per day by casting than a skilled journeyman could by hand after three years of apprenticeship. Casting can be used in the manufacture of all sanitary ware; hence its importance in that branch of the industry is very great. In the manufacture of general ware its importance is not nearly so great, because only hollow pieces, such as cream pitchers, can be cast.

Another change in technique is the replacement of the old beehive kiln with the modern tunnel kiln. In the new kiln the ware is placed on cars and the cars are then slowly drawn through a long tunnel, much as glass is annealed in an annealing furnace. The old beehive kiln, which is still by far the predominant type,

was charged full before firing and then discharged after cooling. It is evident that this process is intermittent. On the other hand, the new tunnel kiln is continuous in its operation, new cars of ware constantly entering the kiln and fired cars constantly leaving it at the other end of the tunnel. The effect on the worker of this change in technique is twofold. The old kilnman was a skilled worker from whom was exacted heavy lifting. Also, since the kiln was intermittent in its operation, his job was of an intermittent nature. The tunnel kiln eliminates these characteristics entirely. It really amounts to an elimination of the kilnman, for the work of the tender of the new-type kiln is unskilled and continuous in nature. The introduction of the tunnel kiln and the casting process brings with it modern plant routing and scientific planning. The result is a high degree of specialization of task.

Pottery is a highly localized, non-seasonal industry in which the laborer is of great importance in the manufacturing process. Furthermore, the industry is a sheltered, tariff-protected one in which domestic competition has been softened by the presence of strong manufacturers' associations. Finally, a decided change in technique is taking place through the introduction of the tunnel kiln and casting process.

INDUSTRIAL RELATIONS

From the analysis of the important economic factors in the industry we may now turn to the nature and condition of the labor relations which have prevailed. This involves a consideration of the origin and growth of the union, a discussion of the collective bargaining machinery and the functioning of the machinery, and an analysis of the final disruption of the collective-bargaining program during the last few years. As has already been indicated, relations were established between the National Brotherhood of Operative Potters as the union, and the United States Potters' Association and the Sanitary Potters' Association as the employers' bodies. The rules governing collective bargaining between the organized workers and the employers' associations were embodied in agreements, one for the sanitary trade

and one for the general ware trade. Separate wage scales were drawn up for the workers in the porcelain and hotel china divisions of the industry.

Probably the outstanding characteristic of the history of collective bargaining in pottery has been the long period of amicable dealings between employees and employers. For a period of over twenty years no major disturbance occurred and no problem arose which was not settled by direct negotiation. This peaceful condition was suddenly disrupted by two very serious strikes in late 1922. The period was preceded by conditions of great uncertainty and strife. First we shall briefly trace the origin of the union and the associations.

The present organization of the National Brotherhood of Operative Potters was formed in December, 1890.[14] Before then the potters had been organized under the Knights of Labor as District Assembly No. 160. Some of the early local unions were organized in 1825. A lockout had occurred in East Liverpool in 1882 caused by the feeling of distrust among the employers as to the policies of the Knights of Labor. This feeling was not so strong in the East. The result was that at the annual convention of No. 160 the western potters sought to have the entire body removed and a separate trade union formed. This movement was not successful, but a later conference called in Toronto led to the organization, in 1890, of the National Brotherhood. Thus this body in its inception was a western organization. For some time there were two unions, the brotherhood and No. 160. In 1893 the eastern potters withdrew from the Knights of Labor and formed a trade union, although still holding aloof from the western group. This body was called the National Potters' Union.

The sanitary workers also had a separate union, which was called the Pottery Workers' Union and had been organized under the Knights of Labor in 1885.[15] It dissolved in 1892 as the result of the unsuccessful strike of 1891. In 1893, when there

[14] "Regulation and Restriction of Output," Labor Bureau Eleventh Special Report, *House Documents*, CVI, No. 734 (1903–4), p. 665.

[15] *House Documents*, CVI, No. 734, p. 700.

was a general reorganization of the eastern potteries and a new union was formed, the sanitary potters stayed out. The sanitary pressers organized separately in 1894 as the National Sanitary Workers' Union. This union continued activity until 1899, when it disbanded to become a part of the National Brotherhood.

During this time the manufacturers had organized the United States Potters' Association in the East and the Western Potters' Association in the West. These organizations dealt with the operatives as organized in their respective sections without any agreements in effect. The present organization of manufacturers is different, the United States Potters' Association being composed of all general ware makers, and the Sanitary Potters' Association of all sanitary makers.

The failure of the strike of 1894 was the beginning of the consolidation of the two labor bodies, the National Brotherhood and the National Pottery Workers' Union. This strike was due to the tariff reduction of 1894, which had caused the manufacturers to reduce wages. The Brotherhood was incorporated under the laws of Ohio in 1894, and the final consolidation took place in December, 1897. Many separate trade organizations which had been affiliated with the Knights of Labor now joined the national body. The Brotherhood joined the American Federation of Labor in 1898. Finally the sanitary workers entered the fold in 1899. At the beginning of the twentieth century the stage was all set for the establishment of harmonious relations and the working out of a system of effective collective bargaining. A consolidated union was now in existence which represented all skilled workers and which had the authority to deal with the manufacturers. The result was the first agreement and uniform scale of 1900.

Until that date conditions of great uncertainty and rather severe strife had existed. The strikes were of 12,304 aggregate days' duration and affected a total of 25,000 workers.[16] They had an average duration of sixty-nine days. The great majority of them were for increase in wages or against a reduction in wages. Two of the strikes were of decided importance. In 1891

[16] *Sixteenth Annual Report of the U.S. Labor Department* (1901), p. 304.

the Pottery Workers' Union in the sanitary trade instituted a strike to secure recognition by the manufacturers. The charge the manufacturers made was that the union was arbitrary in endeavoring to control the employment of all labor.[17] The strike failed and caused the union to dissolve in 1892. In 1894 a severe strike occurred in the general ware branch of the industry. The producers endeavored to reduce wages to meet the reduction in tariff rates that was made in 1894. The panic of 1893 and the large number of idle men in the industry were vital factors in making the strike a failure. The eastern union, which was just newly organized, did not have the strength to withstand a long siege. They accepted a 12.5 per cent wage cut, compelling the acceptance in the West of the same reduction. These two unsuccessful strikes were very important in leading to a consolidation of the union forces. They also made plain the fact that some plan had to be evolved that would eliminate such frequent and disastrous stoppages of work.

Beginning with the first agreement of 1900, these times of strife gave way to peaceful co-operation, and a long period of effective collective bargaining began. It was not until 1922 that direct negotiation failed to function.

The National Brotherhood of Operative Potters is really a quasi-industrial union at the top and a trade union at the bottom. It is composed exclusively of operative potters who are members of local unions that are organized at the several centers of manufacture. The production of pottery necessitates the performance of a number of skilled operations, such as pressing and jiggering. The men working in each of the skilled branches are organized into a union in those places where there are a number of plants. In isolated localities only one local union may be formed, which will include all workers. With this exception each local is composed of workers in but one trade.

The attitude of the union toward the unskilled worker has been one of indifference, and this has made for a real weakness in the union armor. Few of the laborers are members of the organization, and their wages are not set in the agreements. So far

[17] *Report of the Industrial Commission* (1901), XIV, p. 626.

no definite provision has been made for them, and about the only consideration they have received has been in isolated localities where potters were few. The union was formed originally for the skilled worker. This is not the definite position taken today, but the needed change in attitude and revision in organization have not been made. Consequently, with 36,824 wage-earners engaged in 1923, there were but 9,100 union members.[18] The Brotherhood has never asked for nor considered a closed-shop agreement. They have always based their power on control of the skilled man.

The national union holds a convention each year where policies are discussed, reports made, and resolutions passed. The major function of the convention is to formulate the demands or the program which the union representatives will present to the employers at their wage conference. The sanitary conference committee and the general ware conference committee are elected by popular vote of the interested locals. They meet with the respective manufacturers' labor committees, present the demands of the union, and negotiate the new agreement. This is usually for a two-year period.

Wages, working conditions, rules—all phases of industrial relations are subject to agreement between the union and the employers' association. Until 1922 there were two agreements in the industry, one for each branch. Since that time but one has been continued.

The first agreement in the general ware trade was consummated in 1900, when a uniform wage scale was adopted. The eastern workers refused to accept this agreement because of the differences in speed of work. They contended that acceptance would mean virtual reduction in wages. The East did not finally become a party to the agreement until 1903. The second agreement was made in 1901 and was for a two-year period. Until the war no upward or downward revision of wages was made. In 1916, on account of the high cost of living, two supplements to the 1915 agreement were issued increasing wages 15 per cent.

[18] Leo Wolman, *Growth of American Trade-Unions*, National Bureau of Economic Research, Vol. VI.

Additional advances were granted in each of the following years, including 1920. By the end of that year increases on the base prices had amounted to 69 per cent for jiggermen, 75 per cent for pressers, and proportionate amounts for other trades. The depression of 1921 affected the general ware trade adversely, with the result that the industry saw its first reduction since 1897. In the new agreement the manufacturers secured a 17 per cent wage reduction. This one expired in October, 1922, and failure to agree on terms for its renewal led to a strike.

The trend of agreements in the sanitary trade was similar to the trend in the general ware trade. The first one was consummated in 1903, and new agreements were made every two years thereafter. During the war frequent increases were granted. By 1920 these had amounted to from 52 to 55 per cent on the base price. A further increase of 5 per cent was granted in that year. Notwithstanding the provision in the agreement permitting the reopening of the consideration of an agreement at any time, the locals in the sanitary trade would not permit the question of wage reduction in 1921 to be brought before a conference committee. Hence the manufacturers could secure no lowered wage costs during the depression of 1921. When the wage conference finally met at its appointed time in 1922, a deadlock ended in a strike.

There are two things to consider in connection with the continued success of the agreements in the pottery industry. In the first place, the employers were in a good position to grant requests generously because of tariff protection and domestic cooperation. Also it was a period of rising prices and generally increasing activity in business. From 1900 to 1922 there was but one reduction in wages—the one in 1921, which led to the strike of 1922. Under such conditions and with fair leadership success can be readily understood.

The agreements just noted provided the basis of industrial relations. The interpretation of the agreements, the adjusting of grievances, and the setting of new rates in the interim between agreements fell to the standing committees.

Each standing committee, one for sanitary ware and one for

general ware, is composed of six men. The three union members are elected, while the three association members are appointed. In practice this has meant that the union personnel of the committee has changed much more than the employer personnel. With this type of committee it is evident that matters which come before it for settlement are disposed of by collective bargaining. There is no provision for arbitration. Both the union and the association are pledged to enforce the decisions of the committee.

A grievance or controversy regarding a piece price must first be considered by the local union and its local shop committee. If conference between the manufacturer and the local shop committee is unsuccessful, the matter may then be referred to the standing committee by either side. In its consideration of the matter the standing committee calls in witnesses, hears the arguments of each side, and in the case of piece-rate decisions, examines the piece under discussion. If the standing committee cannot come to a decision, the dispute is referred back to the local parties.

The first record of the meetings of the general-ware standing committee dates from 1906.[19] The stenographic reports of these meetings state the nature of the case reported and the decision, with occasional inclusion of discussion. In going over the records, however, and in discussing the procedure which the committee followed with various ones of its members, much was learned regarding the nature of the work which the committee performed. The attempt was always made to settle each case strictly on its merit. It was not possible to do this at all times. In piece-rate disputes the amount paid in other plants for the same article was a controlling factor. If the article was not being made elsewhere, its likeness to existing pieces was a major factor. A further basis used for the settlement of piece-rate questions was the amount of wages which were being earned by men on like jobs. The arguments of both sides were considered and an attempt was made to secure a unanimous opinion. Finally, it often became necessary to "split the difference" to secure a

[19] *Minutes of the Meetings of the Western Standing Committee.*

decision. Of late years the practice has developed in the Western Standing Committee of never allowing a dispute to come to a vote unless the decision will be unanimous. In the case of disputes covering working conditions, rules, etc., the intent of the agreement is always interpreted with the use of common sense.

Thus in the settlement of disputes by the Western Standing Committee the bases used for the making of decisions were: (1) piece rates paid in other plants, (2) likeness to existing pieces, (3) amount of wages considered equitable for the task, (4) splitting the difference, (5) reference to the agreement, (6) common sense.

The fundamental principle upon which the peaceful settlement of disputes by collective bargaining in the pottery industry rests and upon which the making of the biennial agreements is based is that there shall be no stoppage of work, or strike of any sort. Work is to continue as usual pending the settlement of all grievances, under protest if necessary. This principle of procedure is clearly stated in the 1920 wage scale of the Sanitary Potters' Association and the National Brotherhood of Operative Potters. "The cardinal principle of the agreements . . . . is that there shall be no strike or lockout in the case of a dispute. To carry out these principles both sides must understand that they are not privileged to interpret the agreements to suit themselves, neither are they privileged, if matters don't suit them, to stop work. In no case shall there be a suspension of work in any pottery. . . . ."[20]

Violation of this basic principle led to disastrous results to the union. In 1922 two major strikes occurred, one in each branch of the industry. Failure on the part of the union as a whole to recognize the weakening of their bargaining strength because of the introduction of the casting process was fatal, for it spelled defeat from the beginning.

In 1921 the workers in the general ware plants acceded to a 17 per cent wage cut induced by the depression. The union representatives came to the 1922 conference determined to get back at least 7 per cent of the reduction. The manufacturers failed to

[20] 1920 Wage Scale, Sanitary Potters' Association.

see any improvement in conditions. Neither side would give in, with the result that a strike was called for October 1, 1922, the date on which the old agreement expired. When several conferences had failed to adjust matters, the manufacturers stated that they would be more willing to deal with men who were their workmen than with strikers. The union seized on this as a promise to meet them part way in their demands and ordered the men to resume work in all general ware potteries on December 9, 1922, after a 63-day strike. In all, about 17,000 employees had been affected. The union immediately asked for a wage conference at Atlantic City to go over the matter of a wage increase. The manufacturers then found that the union actually believed that a promise of a wage increase had been made. This placed the producers and the union leaders in a difficult position. After many meetings the conference did grant a 4.2 per cent raise. The union came out of this strike in fairly good condition. It had secured a portion of its wage demand; it had maintained its organization and power; and it had succeeded in continuing collective bargaining with the employers and in retaining the provisions for negotiation.

Contrasted decidedly with this are the experiences and results of the strike in the sanitary trade. At about the same time that the general ware producers had secured a 17 per cent wage cut, the sanitary manufacturers asked their employees for a substantial reduction in wages. The locals refused to consider the proposition despite the slump in business, preferring to force the continuation of the old agreement, which had another year to run. As a result the Sanitary Potters' Association was not in a mood for compromise when it came time to make the 1922 agreement. On the other hand, the union leaders saw business picking up and felt that the employers would be willing to renew the old agreement rather than risk a stoppage of work. Therefore the employers' demand for a 20 per cent wage cut was refused by the union representatives. The conference failed to reach a settlement.

The members of the executive committee of the union, leaders for years, investigated the situation, visiting the non-union

shops, studying the possibilities of casting, and estimating the comparative costs of production. A final meeting with the manufacturers' committee secured a compromise wage reduction of 10 per cent.

Opposition to this settlement immediately developed in the union ranks. Unofficial, radical leadership led the large group of young men among the union membership. Not having gone through the long period of strife prior to 1900 and the longer period of constructive development that followed, this element in the union did not realize the advantages of collective bargaining and the hardships of strike. They refused to give even a respectful hearing to anyone urging care and deliberation, howling down their official leaders.

The executive board issued a printed statement which gives the issue clearly: "It is our conviction that a strike at this time to force the renewal of the present agreement will be sure to displace for all time some of those now engaged in the trade and not only destroy the prestige of our organization, but weaken our control of the trade to such an extent that our power for the betterment of those engaged in the industry will be destroyed for years to come."[21]

The union officials recognized the weakening in their bargaining position due to the casting process and the possibilities of that process in fighting a strike. The union membership failed to understand this and preferred to ignore the advice of their leaders. The 10 per cent compromise wage cut was refused and a strike ordered.

On November, 1, 1922, the sanitary workers began their strike. Some of the potteries continued operations. Many plants closed down immediately to make the necessary changes for production by the casting method. In three weeks inexperienced men working as casters were making more pieces per day than the skilled pressers had made. It was also discovered that green hands were carrying on the work in other departments with rapidly increasing success. As a result, after one or two attempts at reconciliation had failed, the manufacturers refused to deal with

[21] *Statement of the Executive Board*, p. 14.

the union any longer. The strike was a complete failure, and the prediction of the union's executive committee was realized in full. The National Brotherhood of Operative Potters officially called the strike off on June 20, 1923, without coming to any agreement with the producers. The sanitary unions were entirely broken, a strike fund of a million dollars was dissipated, and the men had to get work as best they could and at what terms they could. Many of them had to go into other fields of occupation.

A description of the industrial relations program is incomplete without some mention of the personalities of its leaders. The type of leadership plays an important part in the success of any system of collective bargaining. In Mr. Wood, the national president, in Mr. McGillivray, the national secretary, in Mr. Hutchins, the former first vice-president, and in Mr. Carilidge, the present first vice-president, the union had leaders who possessed great common sense, tact, honesty, and personal responsibility. They were and are men who have at heart the furtherance of the activity and service of the union, the well-being of their fellow-workers, and the continuance of the benefits of collective bargaining. The sanitary locals were not so fortunate in their choice of leadership prior to the strike of 1922. The presence of radicals who had none of the qualities or qualifications of the official leaders was the immediate cause of disaster. Had the advice of the executives been followed at this time, the unfortunate strike would not have occurred. One criticism of the union leaders seems justified. Any progressive leadership educates its followers to changing conditions as part of a constructive program. It would seem that the officials of the pottery union had failed in this respect, for the individual members of the union did not grasp until too late the particular significance of the casting process.

On the manufacturers' side there were men equally desirous of establishing and maintaining relations of peace and security on the basis of union recognition. In the sanitary trade, Mr. Campbell did more than anyone else to work out problems incident to the collective bargaining program. Mr. Goodwin, secre-

tary of the United States Potters' Association, also has been a very large factor in the success of the agreements because of the fairness, willingness, and reasonableness of his co-operation.

Thus, industrial relations in the pottery industry have had an interesting history. Out of chaos there arose a strong union built on skill. This union developed a collective bargaining program in conjunction with the two manufacturers' associations. Then for a period of over twenty years there is presented to our view the picture of the peaceful and successful settlement of wage disputes in a protected, sheltered, co-operative industry. This amicable relationship is finally disrupted through changing technique, the introduction of radical leadership, and the business depression.

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EFFECTIVE REGULATION OF PUBLIC UTILITIES[1]

The title of this volume may seem somewhat too comprehensive when it is realized that the discussion is almost wholly limited to rate regulation of public utilities. But in view of the emphasis—the undue and probably wholly unfortunate emphasis—upon that question in public utility law, we should not quarrel with the title. Let us admit at once with the author that effective regulation of public utilities awaits the practical solution, and perhaps even more the placing in proper perspective, of this problem. The book contains a clear statement of the main and subordinate issues involved, and gives the solution now considered most practicable by at least the "theoretical" writers. In many respects, some of which will be noted hereinafter, the book contains the most helpful discussion of the subject, in one volume of brief compass, which the reviewer has seen.

In saying that the problem of rate regulation has been forced out of its proper perspective, there is no desire to belittle the importance of the question. Any matter which deals with the income of a business is not negligible; for, after all, income or the lack thereof means the life or death of the business. But this particular problem has exhausted the time and energy of commissions and courts almost to the exclusion of other pressing questions of service and management. And the whole discussion of it seems to have an air of unreality even as to its effect on the matter of financial return itself. Consider the way that railroad tariffs have been developed—have "growed"—in this country, and how far away they are from "fair return on fair value." Customers' charges are fixed with perhaps never a thought to the fair value question, and then, when the practical tariff men are through, the lawyers, engineers, and experts of this and that kind are called in to justify their result through the application of an entirely different technique for an entirely different end. Yet under the theory of private property—so thoroughly embedded in our constitutions as judicially construed that no change which will affect the present generation, at least, is politically possible—this problem of rate regulation must press upon us. We cannot avoid that; but at least we may put its solution upon some ground of practical reality, comparatively speaking.

[1] John Bauer, *Effective Regulation of Public Utilities*. New York: The Macmillan Co., 1925. Pp. x+381.

This is the present task for the utility field. How shall it be tackled?

I suspect that we "theorists" who advocate the so-called "prudent investment" theory in rate making are in danger of overshooting our mark by refusing to admit such correspondence as actually exists between it and the "fair value" theory. Value depends on expected income; this depends on rates; and rates depend on value—this is a hopeless bog, so we say. Let us reject it for something entirely different and scientific, namely, the original investment as far as prudently made in the plant. Yet this gives those who are satisfied with the "fair value" theory now followed by the courts the opportunity to point out that we are deluding ourselves by not recognizing that even the investment or cost theory is beset with some difficulties and uncertainties.[2] Would it not be better to admit frankly at the outset that both investment and value theories represent only two different techniques for reaching the same end, and that they are to be judged on that basis? And that the investment method is to be preferred as the more accurate and practically workable one, and not necessarily as itself theoretically perfect?

To develop this thought somewhat more, it is necessary to go back to the nature of the private property so zealously protected under our constitutions, and also to the nature of public utility regulation itself. The courts themselves think of the property which they are protecting as something physical, definite, and concrete—like a piece of money, or a purse which the state is trying to take away.[3] Yet they admit that they are trying, in these rate cases, only to secure a fair return to the utility investor, and that such fair return is one having a reasonable relation to the rate of return in the general investment market. If this means anything, it means a return which will induce the flow of such investment money as is necessary to the public utility field. If invest-

[2] See Judge W. L. Ransom's debate with Mr. Bauer, *American Economic Review*, XIV (1924), 269, 658, and with Professor Bonbright, *Journal of Land and Public Utility Economics*, II (1926), 1, 186, 276, 281; with further reply from Mr. Bauer, *ibid.*, p. 408.

[3] Thus Mr. Justice McKenna, dissenting in *United States* v. *New River Company*, 265 U.S. 533 (1924), which upheld the restriction of a "joint" mine with two rail connections to the same number of coal cars per day as was allowed a "local" mine with a single rail connection (p. 543): "The doctrine of the opinion is that the Interstate Commerce Commission, and this Court in sustaining it, can take from property an attribute, almost as tangible an attribute as its physical substance, that is, its position, that which avails and makes wealth of its products. This, in my opinion, is a deprivation of property."

ments of the degree of stability which we expect of utilities were currently bringing only 1 or 2 per cent return, a rate yielding only such a return to the utilities would not be a confiscation of private property. Hence what is protected by the constitution is merely the chance to receive a reasonable investment return competitively determined.[4] And since the determination of this return is a prophecy of future investment rates, it is, in final analysis, but a guess as to the rate of return which will prove attractive to public utility investors and secure the necessary flow of capital to that field. On any theory the final result must be this prophecy or guess; it cannot be anything more exact.

Now it should be noted that this is not so much rate regulation as the restriction on rate regulation. Rate regulation itself is one of the historic burdens of the ancient common callings. The rates must be kept down to a reasonable charge. So we see our present problem in its setting as a part of the whole field of governmental regulation of industry. Political demands are made in a democratic state that the "natural" (i.e., unrestricted) activities of large entrepreneurs must be restrained for the benefit of the whole community (or the politically vocal part thereof); and the statesmen yield to the demand by passing regulatory statutes. Immediately there is a "taking of property" in a very real sense—though perhaps with "due process"—for the whole purpose of regulation is to restrict one class from the exercise of its natural advantages.[5] Then the courts step in to apply a brake to the political policy which has been accepted by the legislature. (Experience shows that it is only a brake, not a permanent obstruction.) They do this by restoring the situation to its natural condition, which usually means a condition substantially unrestrained except by the forces of competition. When and how far the brake should be applied is a problem of law, of statesmanship, of politics, of history, of emotion, of reasoned judgment—in fact of everything that goes to make up constitutional law.

If, therefore, the courts are compelled in any event to indulge in

[4] John E. Kirschman, "The Principle of Competitive Cost in Public Utility Regulation," *Yale Law Journal*, XXXV (1926), 805; see also J. M. Clark, *Social Control of Business* (1926), pp. 366–68.

[5] Henry Rottschaefer, "The Field of Governmental Price Control," *Yale Law Journal* XXXV (1926), p. 438; see also Clark, *op. cit.*, pp. 298, 320, and the "consumers' disadvantage" theory of R. G. Tugwell, in *The Economic Basis of Public Interest* (1922).

prophecy as to the future rate of investment return, the result, under whatever theory followed, cannot be precise and mathematical. Under the prudent investment theory the rate base itself becomes a reasonably fixed quantity, while only the rate varies with the market investment rate; under the fair value theory both vary as estimates of expected receipts vary. The first is relatively more precise and accurate; but this may be felt subconsciously to be a defect rather than an advantage. If the final result is only at best a reasoned guess, why pin one's self down to show the process by which the result was reached? One's conclusions may be right by instinct or otherwise; why disclose possible errors in one's premises? Then, too, from the political standpoint it may cause less friction to vary rates when only the conclusion can be seen. Thus a rate increase which is justified by showing a low rate on a huge fair-value rate base may cause less public clamor than the allowance of a high rate on a low original investment. And how can the steps to the end be higher or more scientific than the end itself? And if *that* is only a reasoned prophecy at most, is not a reasoned conclusion as to present value as good a premise as original investment? It is, I believe, subconscious feelings of this kind, coupled with the inertia to tackle a red-hot poker in the shape of changing a previously announced rule, which has led courts to stick to the fair-value theory in spite of the clamor against it. Not enough attention has been paid to the resolute refusal of the courts to accept the dilemma of the economists that if not the investment theory then it must be the reproduction theory. The judicial rule is neither, but "fair value," which is a reasoned judgment, flitting between the two.[6] One may argue that this is entirely illogical, but so also is the verdict of a jury. And the jury system works, at least after a fashion.

[6] Thus, in *Standard Oil Company* v. *Southern Pacific Company*, 268 U.S. 146 (1925), where the question at issue was actually the value of a ship as damages, but where the court relies on the rate regulation cases as authorities, Mr. Justice Butler says: "It is to be borne in mind that value is the thing to be found, and that neither cost of reproduction new, nor that less depreciation, is the measure or sole guide. The ascertainment of value is not controlled by artificial rules. It is not a matter of formulas, but there must be a reasonable judgment having its basis in a proper consideration of all relevant facts." See also Rose, circuit judge in *United Fuel Gas Company* v. *Public Service Commission*, 14 F. (2d) 209, 214, (1926): "Perhaps one of the reasons why reproduction cost, although one of the weightiest elements in the determination of present fair value, is not necessarily controlling, is the very fact that, in arriving at it, the experts always include an expenditure for overhead far in excess of any which the utility ever incurs."

It therefore seems to this reviewer that about as much assault has been made on the theoretical absurdity of the fair-value rule as is profitable, and that the more compelling argument now is probably the practical one of the cost and waste of the fair-value method and the comparative simplicity and effectiveness of the investment method. Mr. Bauer shows this strikingly and by a very simple expedient; one, I think, nowhere else so well developed. It is to show the connection between sound methods of rate regulation and modern systems of utility accounting. He says, "The point of view maintained throughout this work is that most of the facts required for satisfactory and effective regulation must be shown by the accounts. If they are honestly and scientifically kept, they furnish the means by which control can be based upon readily available facts, so that guess work can be practically eliminated from regulation." And he adds, "An important criticism of the accounting control is that it has been too often treated as a thing for itself, and has not been definitely coupled with rate making and the other purposes of regulation." It is obvious that under the fair-value rule the accounts can hardly perform this important function. After all the various experts are through and the stress and strain of the long trial is over, the fair-value method leads only to the conclusion fitted for one point of time, now long past,[7] and the valuation for any other period is all to be done over again. Under the investment rule, however, changes in the investment (which would only be made under commission control) would be precisely reflected in the books of the company.

The author recognizes that with already established companies the transition to the prudent investment theory would be one of some difficulty, owing to the lack of evidence, in many cases, of the original investment and the fact that the present stockholders are largely not the original investors, but those who have purchased at a premium.[8] His solution is one currently urged by writers, namely, an appraisal of the existing properties as a compromise rate base to be used as the starting-point for future rate regulation. Such compromise must prob-

[7] In *Pacific Gas and Electric Company* v. *San Francisco*, 265 U.S. 403, the supreme court in 1924 reversed and sent back for new proceedings cases involving valuations for the years 1913, 1914, and 1915.

[8] He properly emphasizes the fact, however, that only common stockholders are entitled to consideration here, not the bondholders, and in general the preferred stockholders, who are limited by their contract; and hence, even if some allowance be made for such stockholders, the amount involved is comparatively small. See pages 122–30, 266–72.

ably be obtained by different means in different cases: in many cases a "fair value" found by the courts may be accepted by both sides. Legislation as an aid is desirable, if not necessary; perhaps the costly federal valuation of the railroads may eventually prove of some worth as leading to some figure accepted by all as a proper rate base for each road.

In this general connection the author discusses the legal background against which such legislation must stand. Here he gets away from the more practical arguments of the rest of the book, and the result, it is thought, is the least successful part of the book. The discussion of early rate cases is incomplete, and the striking about-face of the Supreme Court in its attitude toward the due-process clause is not noted.[9] An extended analysis of the more recent rate cases in that high court is given, and the author, while apologizing as an economist for assuming to approach the profound domain of the law, makes narrow distinctions of which any lawyer might be proud. His conclusion is that, in spite of the Court's language, the decisions can be reconciled only on the investment theory. The difficulty is, however, as previously pointed out, that the Court will not accept the dilemma of the economist and admit a result not wholly justifiable under the reproduction test to be therefore and necessarily a conclusion based upon the investment test. Its fair-value rule is sufficiently nebulous to cover many inconsistencies such as this. As a suggestion of what the Court might do, if so disposed, Mr. Bauer's reconciliation of the various cases is sound enough; as a prophecy of what the Court will do, there is more doubt. The question will be of increasing importance with the passage of legislation along the lines of the prudent investment doctrine. Mr. Bauer feels that such legislation will be upheld; and this is to be hoped for, although the Court attitude is not altogether promis-

[9] The reference is, of course, to the shift occurring roughly between 1876 and 1890 from the view of this clause as securing to the individual a fair trial under proper procedure to the view of it as also securing to him a fair substantive law, at least as far as the legislature is concerned. This has been often traced, and it was not necessary for Mr. Bauer to do it again; but he seems (p. 66) to consider the Supreme Court's change to have been merely a progression. The change has now gone so far that staunch defenders of the court are expressing alarm. See F. Dumont Smith, "The Revolution," *American Bar Association Journal*, X (1924) 505; Charles Warren, "The New Liberty under the Fourteenth Amendment," *Harvard Law Review*, XXXIX (1926), 431.

ing.[10] I wonder if it would not be more persuasive to the judges, however, to point out that either method is an attempt to preserve the same thing under the Constitution, rather than to try to convince them that they have been following a certain method when they think they have not been doing so at all.[11]

Space is lacking for a discussion of the remainder of the argument for a means of effective rate regulation. It seems thorough and complete, ending with a plea for high standards of commission organization. Attention should be called, however, to the especially clear treatment of two troublesome problems: depreciation and the rate of return.

Mr. Bauer's general argument as to the treatment of depreciation, based again upon scientific accounting methods, would seem unanswerable from the standpoint of theory and of sound method. The only question left is probably how far it may be applied to companies where such methods have not been applied in the past. The question of depreciation comes up in connection with the annual charge for depreciation as a part of the operating expenses. Here the author argues for an adequate charge and the setting up of a complete depreciation reserve, rather than mere actual replacement charges. Depreciation is again an issue under the fair-value theory, upon the point whether depreciation should be charged against present appraisals ("cost of reproduction new, less depreciation"). Since such appraisals are probably necessary as the starting-point for any future application of the investment theory, and since the utilities themselves strongly object to the deduction, the question is a burning one. Mr. Bauer's conclusion in favor of the deduction—the present view of the Supreme Court—seems wholly sound. And finally there is the treatment of depreciation under sound accounting methods, applying the investment theory.

[10] See *Pacific Telephone and Telegraph Company* v. *Whitcomb*, 12 F. (2d) 279, 285 (1926), holding that where state courts, following a statute of the state of Washington, apply the "cost," and not the "reproduction," method of valuation, the utility need not appeal to the state courts, but may resort directly to the federal courts, which will then apply the fair-value theory.

[11] The former course also will make it easier for the courts to treat past and future investors in a different manner, as apparently they must to make the investment-theory work. The past investors will be paid a compromise return on a compromise rate base; the future investors will be treated on a strictly cost basis, as Mr. Bauer argues. See also Clark, *op. cit.*, p. 381; note by R. L. Hale in Smith and Dowling's *Cases on Public Utilities* (1926), p. 1078.

This, as the author shows, is a simple matter. A depreciation reserve account is set up and this appears as a liability (or deduction from assets) in the balance sheet; while the amount of this account goes into the assets either as separate cash or securities or as general assets. It is thus a keeping of the assets intact by yearly appropriations from current earnings. The amount of the original investment is shown at any time by deducting the depreciation reserve from the assets. The problem may be complicated by the fact that too high or too small a depreciation reserve may have been established. Here Mr. Bauer concludes that the deduction should be not the actual reserve established by the company, but a proper reserve; so that the company would pay a penalty by having set up too small a reserve and gain by too large a reserve. This has since been established by the Supreme Court in *Board of P.U. Commissioners* v. *New York Telephone Company*, 46 Sup. Ct. 363 (1926), holding that an excessive depreciation reserve in the past does not justify an order for present low rates. Such a rule is probably sound as a general principle, but since rate making is not an exact science, it would seem that some modification for error, if made with reasonable promptness, should be permitted the commissions.[12] The author's conclusion that the depreciation reserve is a deductible item seems therefore clear.

As to the rate of return, it has been suggested above that it must fluctuate with the market-investment rate. But Mr. Bauer argues quite properly that it should not so fluctuate, except as new additions to capital are actually required. He advocates fixing a uniform equitable rate for past investment (and he suggests 7 per cent as approximating justice between bondholder and shareholder), and for future investments, a rate to reflect the actual cost of new financing. This would involve the market rate at the time of the financing, but not a fluctuating rate as though securities were being issued at the moment when rates are being fixed. This is another step in the definite application of the cost theory to utility investments, at least for the future, and seems a proper application of the prudent investment principle. It would take a large measure of uncertainty out of the rate and should lead to more stability in the investment itself.[13]

[12] See R. L. Hale, "Non-Cost Standards in Rate-Making," *Yale Law Journal*, XXXVI (November, 1926), p. 56; also comment on the case in the same journal.

[13] The problem of providing incentive to the utility management, as distinguished from the investor, would still remain. This is considered somewhat

The literature of discussion and argument upon utility rate regulation has now become so voluminous that any addition thereto should justify itself by some real contribution to the subject. The present book satisfactorily meets this requirement by its clear presentation of a fully developed practical way out of the present morass.[14]

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by Mr. Bauer in chapter xiii; and see also, as to rates dependent in part on efficiency, Clark, *op. cit.*, pp. 394–97, citing C. S. Morgan, *Regulation and the Management of Public Utilities*, p. 58; Smith and Dowling, *op. cit.*, pp. 1081–85.

[14] Since the above was written, a majority of the Supreme Court have emphatically reiterated their acceptance of the fair-value rule in *McCardle* v. *Indianapolis Water Company*, 47 Sup. Ct. 144 (1926).

BOOK REVIEWS AND NOTICES

The Measurement of Economic Value. By DAVID ATKINS. San Francisco: The Lantern Press (Gelber, Lilienthal, Inc.), 1925. Pp. xxviii+292.

In this book, which he describes as a briefer cross-section of his *Economics of Freedom*, the author, a California engineer, continues his fight for a more scientific economic theory and for a more workable standard of value than is afforded by our modern gold-bank-credit system. The present work is more soberly written than its predecessor; but with all his good will toward the physical scientist (or anyone else) who endeavors to make economics more definite and accurate, the reviewer finds it impossible to follow the argument. The basic defining equation for value equates it to effort÷resistance (p. 10). It is hard enough at best to put content into these symbols so as to show a relevant analogy to Ohm's Law, but on the following page difficulties increase. Profit is twice identified with value, while yield also is defined as "the total result of human effort in a given period," or "gross value per unit of time." Cost is then defined as "the total sum of human effort per unit of time," and following this is the equation: yield—cost=profit. Taking the statements at what they seem to say, the relation $V=E/R$ has been transformed into the relation $V-R=V$, which is discouraging. No interpretation of the way in which time may enter into the concepts, or of the relation between gross and net value, seems to make sense out of it in economic terms. When, on page 14, in speaking of "work" in the physical sense, the author confuses the energy relations involved in setting a mass into motion against its own inertia with those involved in moving it against the force of gravity (if not by implication with the still different relations of motion against a frictional resistance), one is tempted to ask whether he is trying to play a joke on the economists. Just below this, on the same page, is the assertion, out of a clear sky, that "the ultimate basic dimensions of economic value are population, land-area, and time." If the text develops any definite, quantitative relation between these magnitudes and effort and resistance, the reviewer cannot find it—partly, no doubt, because of his precedent con-

viction (prejudice or tradition?) that no relation of the kind exists in fact.

With much of what Mr. Atkins says by way of objection to the present value-standard and circulating medium most economists will find themselves in general agreement. The reviewer is of the opinion, furthermore, that economic science has paid too little attention to one aspect of this situation, mentioned rather than developed by Mr. Atkins, namely, the social cost of paying the banking system as "interest" an annual sum comparable with the value of all the gold used in the system, for the somewhat questionable service of "economizing" gold. But we simply do not "get" the author's proposal for a medium consisting of claims to the use of an "average acre" of the area of the United States, from bad lands and open water to oil fields, truck farms, and metropolitan sites. The figures given (p. 57) showing a high degree of constancy in the ratio of land value to total wealth in this country from 1870 to 1920 are interesting, and would be more so if one had more faith in the accuracy of the estimates and in the probability of finding a similar ratio for other countries and other periods. What would the facts turn out to be even in the United States since 1920?

It is to be feared that the value of Mr. Atkins' work to the "traditional" economist will consist mainly in the suggestiveness of his ideas, and in the light which it throws upon the problem of educating the public in economic theory.

FRANK H. KNIGHT

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REJOINDER BY THE AUTHOR

The fact underlying Ohm's law is that effective energy varies inversely as resistance. If philosophic content is to be put into the phrase $\frac{\text{"Effort,"}}{\text{Resistance}}$ I cannot do better than employ the words of Pareto, who speaks of value as the relation between human desires and the obstacles that lie in the way of their gratification. If a practical application is to be made of Ohm's law, as it concerns economics, it becomes necessary to find a relative resistance-constant. My claim is that ground rent is the only available constant. A force-constant is not easy to find, unless it is expressed in terms of resistance; and this is the reason economists look with justified suspicion on the energy-hour. A resistance-constant is much easier to find, and it is only necessary to make sure of its relative integrity.

I see no difficulty in the way of an identification of profit with net value. Profit may be regarded as an expression of effective human energy per unit of time. Value may be regarded as the relation between initial energy and resistance. The number of available k.w.h. for sale may represent an electrician's profit. The relation between his initial hydraulic energy and the resistances of his distributing system represents the value of his plant, from a dynamic point of view. The expression "Value equals $\frac{\text{Effort}}{\text{Resistance}}$," is very easily reconciled with the expression "Yield per unit of time minus Cost per unit of time equals Profit per unit of time." An engineer, when he is calculating his daily profits, is justified in deducting the number of k.w.h. lost in overcoming resistance from the number of k.w.h. generated by his dynamo. But he is not in conflict with Ohm's law. However, if he were urging his directors to make an appropriation for the betterment of his distributing system, he would make it very plain that any expenditure made for the permanent diminishment of resistance would be a direct factor of value in a continuous series of operations, though it is none the less true that the initial energy spent in overcoming resistance for a given period of time could be stated as a negative quantity. Granting that the tendency of society is toward a constant improvement of environment, or diminishment of resistance, the relation between the arithmetric and geometric expressions for value may be stated very shortly, as follows:

$\frac{\text{Effort}}{\text{Resistance}}$ at point b in time minus $\frac{\text{Effort}}{\text{Resistance}}$ at point a in time equals $\frac{\text{Yield minus Cost}}{b \text{ minus } a}$ equals Profit per unit of time, or

$$\frac{E_b}{R_b}-\frac{E_a}{R_a}=\frac{Y-C}{b-a}=\frac{P}{b-a}$$

I must plead "not guilty" to the charge of attempting to play any joke on the economists in using dynamic parallels. The energy relations involved in setting a mass in motion against its own inertia, in moving it against the force of gravity, and in moving it against frictional resistance, are at bottom identical. Inertia, friction, and the resistance interposed by the force of gravity are no more than variations in resistance of calculable kind and quantity. As an example, in towing a barge upstream from the sea each type of resistance is encountered and is dealt with by the horse-power of the tug. When it comes to the art of measurement, the physicist has made progress be-

cause he has recognized that the negative force of gravity may be employed as a relative constant.

If the repugnance to trespass we call "ground rent," which I suggest may be employed in economics as a relative constant, has any integral relationship to area, population, and time, I cannot be accused of putting these measurable limits forward out of a clear sky on page 14. Their significance as available economic dimensions had already been dealt with on page 9, and chapter v deals with nothing else. The parallel limits, or dimensions, of the physicist—space, time, and density—are in themselves quite unrelated to the energy he measures by means of them. Space, time, and population-density may appear to be unrelated to economic value; but if the ratio between effort and resistance determines the occupancy value of area, and if population tends to move toward areas in which resistance is diminished, there is not much question that ground rent, per unit of time, reflects occupancy value.

In using the term "average acre" I tried very hard to make it plain that I was referring to an undivided share in total national acreage. It is a purely imaginary acre which can be assumed with ease, but cannot be found by the most eager "realtor." I am quite unable to see that local variations in the character of land affect the mathematical integrity of a fraction of the whole. Bad lands and metropolitan sites do not impair the average occupancy value of national area any more than paupers and millionaires affect per capita wealth.

That there is a relationship between total ground rent and total occupancy value, and between total occupancy value and total national wealth, seems to me self-evident. I was more pleased than surprised to find figures that supported this belief. In response to Professor Knight's question as to whether estimates made since 1920 would confirm the figures cited on page 57, I would point out that at the request of the U.S. Senate the Department of Commerce made a study covering—if my recollection serves me—the year 1924. The ratio between the value of bare land and total wealth was, as I remember it, 35 per cent, or almost identical with that of 1890.

DAVID ATKINS

MANILA, PHILIPPINE ISLANDS

REPLY BY REVIEWER

Superficially, Mr. Atkins' reply clears up some of the difficulty I encountered in understanding his two books, but the essential issue goes much deeper. In a brief review it seemed impracticable to enter

upon any real argument on the complex problem of applying the concepts of dynamics to economics. However, the problem is as vital as it is difficult; and its merits, as well as fairness to both Mr. Atkins and myself, seem to justify a few further remarks.

The general equation of dynamics, that "effect equals force divided by resistance," derives most of its value from the fact that so commonly the "resistance" is a constant property of the material dealt with. This is true of electrical resistance (under given conditions as to things outside the electrical relationship itself, such as temperature); it is also true of mass or inertia (for ordinary terrestrial velocities), and holds approximately for viscous and frictional resistance. But consider the case of magnetism. Here also the equation is applicable, but loses most of its simplicity because the magnetic resistance of iron is not a constant, but a function of the degree of magnetization itself, and a function which can only be plotted experimentally for any kind of material. Yet the relation is still useful, since the permeability curve, once determined, can be relied upon to be the same for the same core and for others of identical composition and treatment. If it were not for this uniformity, the conception would have little meaning.

In his attempt to apply the equation to economics, Mr. Atkins places land area in the position of resistance. But it is evident that he does not really mean geometrical area, or any or all physical properties of the environment, but simply the actual economic resistance. His "average acre" is not really an acre, but a value magnitude, subject to change with any change in any economic condition, and in particular with any change in the value judgments of human beings or in their technical knowledge, skill, and equipment. Moreover, at any given time the resistance varies over a wide range from one economic enterprise or process to another.

If other considerations justified the procedure—if anything were to be gained by it—we could, of course, invent a resistance function, more or less analogous to the permeability curve, and fit the facts to this form of expression. It would amount to a reformulation of the conventional law of diminishing returns. Mr. Atkins does not go so far as to recognize that it would be a function and not a constant, since diminishing returns is a fact. And when we add that the units would have to be redefined in virtually every separate case to make the equation balance, it is evident that we are not dealing with a genuine quantitative law and that this form of statement is misleading.

Similar considerations, which I do not feel justified in elaborating here, will show that even less are the other two factors definable in objective and measurable terms. If population is taken in the objective sense, it does not at all correspond to actual economic "force." Time enters into economic theory in a way to give rise to serious problems chiefly in connection with the capital concept. But Mr. Atkins summarily disposes of capital by simply lumping it in with the environment, an illicit procedure surely. (*Op. cit.*, p. 10.)

Little enough is clear in connection with the problem of a mechanically scientific quantitative economics, but it surely is clear that in such a formulation of economic theory the units have to be defined in relation to facts of choice (utility surfaces or some equivalent conception) on the one hand, and to the existing state of the technical arts (productivity surfaces) on the other. It is just a "brute" fact that area and time, and colors and textures and odors and all physical magnitudes, function as forces and resistances in the economic process in accordance with the way in which human beings feel toward them, and what they know of what can be done with them, and with the way in which people are equipped with tools as well as technique for changing and using the properties of physical things.

However, Mr. Atkins is entitled to credit for wrestling with the problem; and, if he stimulates economists to wrestle with it, he will contribute to the advancement of economic science. His work has been of real value to the reviewer.

F. H. K.

The Chronicles of the East India Company Trading to China, 1635–1834. By HOSEA BALLOU MORSE. 4 vols. Cambridge: Harvard University Press; Oxford: Clarenden Press, 1926. £3 10*s*.

The author of these volumes is a well-known writer on Chinese economic and administrative affairs. Born in Canada, educated in the United States, he has spent years of his life in the English archives writing about trade in China. Twenty-five years of service in the administration of the Chinese customs system have given him an admirable background for the present work.

The plan is not to publish the records of the East India Company in full, but to give a running account of the trade of that Com-

pany in China with copious extracts from the sources. The author does not stop to tell us much about the archives, or his sources generally, but supplies us with many facts direct from the originals. These four volumes, indeed, contain descriptions of the various shipments to and from Canton, grouped under the seasons in which they occurred. The names and tonnage of the ships are given, and much about the supercargoes, but most about the articles of commerce. The English were in hot water in China throughout the period. The author amply illustrates their difficulties, large and small.

In 1637 the Company fought its way into Canton. When the Chinese fired upon the Company's ships, the English returned in kind, and taking down the Chinese flag, hoisted their own. Cannons from the fort were seized and two junks captured. Thus was the English trader's desire for friendship and commerce made known (Vol. I, pp. 19–20)! This was a significant beginning for the stormy affairs of later years. The English trader has always played a strong part in China; very early he learned to dominate the Chinese people. It has turned out much to his benefit, and, with a few exceptions, has been helpful to China.

It should be noted that while the records are said to begin at 1635, there is in fact little information for the period before 1671. And it takes less than 150 pages to get to the year 1713. After that there are still gaps, the most serious being the period 1754–74. Thenceforth there is no break in the series.

From China the Company obtained tea, silks, chinaware, gold, copper, zinc, sugar, nankeens, and many other commodities. To that country it sent silver, lead, tin, and woolens from England; spices and sandalwood from the Islands; and cotton and other goods from India. One of the great weaknesses in the whole story is lack of sufficiently detailed information about the goods traded in between China and India.

Although the Company commonly made a profit of 25 or 30 per cent, it had much to complain of. The Chinese authorities made many delays in permitting the ships to land or depart. Customs were increased from time to time, and officials were ever ready to seize upon an excuse for imposing some exaction, which the Company often paid, carefully stipulating, however, that it should not be made a custom. Thefts were common, and the prices of ship stores and provisions were thought high. The fixing of prices by the Chinese merchant guild was reluctantly accepted.

This guild of merchants, or Hong, as it was called, was a regulated company, like the old merchant guilds of medieval Europe, like the Merchant Staplers and the Merchant Adventurers. From two to thirteen merchants were given the sole right and duty to trade with the East India Company. Apparently such a guild was founded at Amoy in 1704 and at Canton in 1720. It was abolished at Canton in 1770 and its revival threatened in 1816. Its intermittent history certainly could not be written from the English sources published in this work. But the general situation was clear: to each Hong merchant was assigned a proportion, one-quarter of the English trade, or one-eleventh, or whatever it might be, according to the number of merchants. Such a merchant took his share of both imports and exports. Some of these merchants were old and tried; some, young and inexperienced. Many displayed great integrity and were implicitly trusted by the English Company.

This merchant guild was established by the Chinese government to enable the merchants of Canton to hold their own in dealing with such a powerful and well-knit Company as they had to face in the trade in question. The English Company was formed on the joint-stock principle with a directing committee in London, and ultimately also with a single managing committee in Canton. This committee in Canton was made up of the Company's supercargoes, one of whom was president. At first the Chinese, with all their skill in bargaining, apparently suffered from competition one with another for the English trade. They paid too high prices for imports, and they found it tempting to borrow from the English Company at high rates of interest. Bankruptcy was a not infrequent occurrence. Chinese merchants were often the pawns of the Company. So, to remedy these disadvantages and to provide security for the customs which these merchants were themselves to pay to the government, the merchant guild of Canton was set up. Against the English corporation with its ample supply of capital and able management, however, such a guild could have no large measure of success. The Company did not want it, non-Company traders could evade it, and the Chinese officials were always ready to be bribed to spoil the monopoly.

The Chinese had much to complain of, apart from their unequal commercial position. The English, often provoked, dealt roughly with the Chinese, even to the point of slaying them. Then when it came to dealing out justice, the English objected to the application of Chinese legal procedure and customary law. The Chinese objected to the

export of silver, which they were often powerless to prevent. In the early part of the nineteenth century they objected to the importation of watches, clocks, and music boxes, but these they had to take. Most of all they objected to opium, with which foreigners were debauching their people. Of course the Chinese were also themselves to blame in this matter: they would use it, their merchants would handle it, and the officials would let it come in when they were sufficiently bribed. After 1782 the Company itself probably took no direct part in the importation, and tried to prevent its officials from participating in the trade. But opium did come in by the thousands of chests, apparently in the Indian ships not easily controlled by the Company; doubtless much of it in the freight belonging to passengers. Portuguese and Americans, Dutch and French, were likewise greedy of the profits to be secured by selling opium to the Chinese. It was just a question whether it was to be Indian or Turkey opium, imported by persons under the British or a non-British flag. The whole situation was anomalous, there being no power to correct it. One is reminded of the analogy of prohibition in America at the present time.

What a lot of detailed information there is in this book about shipping, coins, bills of exchange, and individual traders! There are the active and persistent English supercargoes sticking to the main chance of Company profits. There are the shrewd honest Chinese merchants of wealth, themselves deceived by other Chinese traders, but making good any deceptions from which the English had suffered at their hands. And then, behind the scene, there are the miscellaneous crew of irresponsible Chinese traders and foreign dealers coming as passengers, as well as rival companies or individuals getting in under sundry pretences.

Not a little is recorded about the English interloper. Would the author had followed up the story from other English sources to learn just who they were! Some sailed under foreign flags, and some gave up their nationality to participate in the lucrative China trade.

A special study of the supercargoes would be particularly welcome. They were trusted and experienced merchants who made the Company successful. At first they were stimulated to action by being allowed space for private trading. Later this was curtailed, and then withdrawn, a higher salary being substituted for the old privilege.

Looked at largely, this is the story of how the English merchants extended the trade of metropolitan London. Canton was the distant outport, like Salem, New York, and Charleston. London fo-

cused everything in itself, except for the triangular trading in China, India, and the Spice Islands. It is the story of how the English cut into the Portuguese sphere of influence, rode roughshod over the Dutch territory, and centered the most profitable bits of world-trade in London. All this was furthered by the superior type of organization of the East India Company and by the monopoly which it enjoyed, in Canton, until 1834. But what the other English traders could participate in only after that date, the American merchants had shared right after the Revolution. Doubtless the American political action helped somewhat to prepare the way for the new liberal régime in trade. On the whole, one gets the impression that it was best, in the early years of the trade, to have such a monopolistic system as that of the Company. But, of course, on this particular subject the Company's archives hardly provide impartial evidence.

An elaborate index adds to the usefulness of this work. And yet these volumes are not books of reference. One finds raw material which he himself must collect, collate, and digest. On the other hand, the scholar seeking the exact original documents is not quite satisfied, because the editor, selecting certain parts—no one can tell what proportion—stands in between the investigator and the originals. It is a bit surprising to find that there are disclosed few capital facts which are new; possibly none at all. Nevertheless, one who goes through these four volumes will finish with an intimate idea of how the London-Canton trade was actually transacted.

N. S. B. GRAS

UNIVERSITY OF MINNESOTA

New Tactics in Social Conflict, A Symposium. Edited by HARRY W. LAIDLER and NORMAN THOMAS. New York: Vanguard Press, 1926. Pp. x+230. $0.50.

Believing that the post-war developments in the field of industrial relations which have attracted much attention on the part of both employers and workers—i.e., labor banking, company unions, employee stock ownership, welfare work, and new types of combination and competition—had not been adequately examined as to their underlying social significance, or as to whether they constitute new defenses for the further entrenchment of capitalism, the League for Industrial Democracy, at the summer conference of 1926, considered these movements, particularly from the labor point of view. The dis-

cussions which there took place form the subject matter of this book.

Mr. George Soule, discussing the development of the employee-stock-ownership movement, maintained that the principal advantages thereof accrued to the employers and not to the workers. It was giving the employers a greater concentration of control, and an increased loyalty and productivity on the part of the workers, who were duped into believing that they had become significant part-owners of the industry. He indicated his belief in the "professionalization of management" and the further separation of management and ownership, as means of decreasing the influence of the profit motive in industry and thereby benefiting the workers. (Section 1.)

Mr. J. S. Potofsky, the vice-president of the Amalgamated Clothing Workers Union, explained the reasons that have led trade unions to enter various business fields, and particularly that of banking, as being (1) the desire to render services to their members which the ordinary banks were unable to render, (2) the development of co-operative loan services, investment services, and housing enterprises, (3) the desirability of educating the labor movement in the technique of business, and (4) the desirability of preventing labor exploitation by banking interests which secure a large share of their funds from the savings of the workers. (Section 2.)

Mr. R. W. Dunn, in his discussion of the extensive post-war development of "company unionism," argued that employers were not concerned primarily with the betterment of labor conditions but with the strengthening of their own position as employers, by making the employee "factory conscious" and more dependent upon the employer for the betterment of wages and working conditions, thus breaking the strength of the trade-union movement. Mr. Ordway Tead, opposing this point of view, maintained that the development during recent years of personnel and welfare work was not entirely due to attempts at union repression, but that it was intended in many instances to give material gains to those workers who had not been organized and had not benefited from collective bargaining. He also held that the employee-stock-ownership movement offered the basis for real financial partnership between workers and owners. These recent movements, he held, were preparing the way for the attainment of democracy in industry. (Section 3.)

Mr. Stuart Chase, speaking on "Mergers and the New Competition," argued that although the size of the business unit had been tremendously increased by the merger movement, in an attempt to

eliminate competition, a new competition, more intense than ever before, was being engaged in between industries, rival commodities, and territories. The primary cause of this newer competition was alleged to be that the industrial plant has been so overbuilt as to have a present capacity 100 per cent in excess of normal demand. The only remedy was to be found in scientific industrial planning, to be substituted for the present blind and purposeless anarchy. (Section 4.)

A section is given over to the discussion of modern "American Imperialism," particularly as manifested in the increase of American foreign investments, and the American foreign policy as developed in Santo Domingo, Cuba, and Bolivia. It is maintained that economic imperialism arises out of the exploitation of the home-workers by the capitalistic classes, and that it results in the exploitation of the laboring classes in the exploited countries. (Section 5.)

The development of a new type of propaganda by capitalist exploiters is sketched by McAlister Coleman. He contends that the new type of propaganda sent forth by the modern high-powered publicity agent is used as a means of convincing the public of the necessity of private exploitation of public resources, particularly in the field of public utilities. (Section 6.)

A résumé of recent developments in the power, coal, and forest branches of the national resources leads to the conclusion that public control is necessary to protect the public from continued exploitation. (Section 7.)

The impartial reader will question the desirability of this publication of the proceedings of the L. I. D. conference as a record of "labor's reaction" to these new developments in the field of industrial relations. Most of the papers presented are by those who would classify as "liberals," or "labor sympathizers" from the "silk-stocking class," or those who are classed as "socialist radicals." The workingman's reaction is not presented. All of the papers are very general and rambling; and therefore, while perfectly suited for popular presentation at a general conference, are largely a waste of time for the serious reader. No particularly worth-while conclusions are presented which have not already been before the public. The inclusion of over eighty pages of "general discussion" by various individuals, should certainly have been omitted, since it is seldom directed to the immediate problem up for comment and consists largely of meaningless generalities. This book can be recommended only for "popular" consumption.

W. C. CLEVELAND

UNIVERSITY OF CHICAGO

Bolshevism in Trade Unions—A Plea for Constructive Unionism. By JOHN A. DYCHE, with an Introduction by JULIUS HENRY COHEN. New York: Boni & Liveright, 1926. Pp. xiv+224.

Mr. Dyche, himself a Jew and at one time a cloak-maker, gives us here a vivid picture of some of the conditions that are creating problems in the New York cloak trade. He condemns the tactics of the International Ladies' Garment Workers' Union, which, in his opinion, are responsible for the present ruinous state of the industry.

Classifying the Yiddish workers, who constitute the bulk of the labor force, into two types, Moishe and Yankel—the ass and the arrogant fellow (p. 98)—he laments the stupidity of those of the former type who are duped "by the loud-mouthed demagogue" (p. 160), and denounces the duplicity of those of the latter—those union politicians "who make demagogy their profession" (p. 195). These leaders he charges with misleading the workers, misrepresenting situations by labeling failures as "victories" and stressing the necessity of "fighting the bosses" (p. 155) rather than serving as "industrial specialists" (p. 140).

In his chapter on "Hold-up Unionism," Mr. Dyche gives his concept of the function of unionism as follows:

> The primary object of any labor union is to try as far as it is within its power to equalize the price or cost of labor in the industry, to see that the hours of labor as well as the rates of wages and other general conditions are on an equal basis in all shops under its control. This is exactly what is meant by union standards and union conditions. Not as a question of abstract justice and fairness to the employee, but because it is of vital importance to the members of the organization. And union activity not directed in this channel will do the workers more harm than good. Just as the union must watch that an employer in a particular shop does not reduce the labor standards, so must the organization be equally on the alert that the workers in a particular shop do not abuse the power of the organization, to raise the wages above those agreed upon by the union and the employers in the industry.
>
> Assume, for instance, that the union in a particular industry controls two competing establishments. In establishment A, the wages are, let us say, eight dollars, while in establishment B, the wages are ten dollars a day. If the union forces the earnings in establishment A from eight to ten dollars a day, thus equalizing the price of labor in both shops, it has benefited the workers in the whole industry, and incidentally the employer of establishment B. On the other hand, should the union force the ten-dollar-a-day es-

tablishment to pay more than it does while leaving the other competing firm alone, the probabilities are that the trade of establishment B will drift to the lower paying firm and the earnings of the rest of the workers in the trade will drop accordingly (pp. 131, 132).

It is precisely in this way, according to Mr. Dyche, that the International Ladies' Garment Workers' Union fails to function. Using coercion instead of co-operation, the union enforces standards upon the inside manufacturers, whose standards already are superior to those of the outside shops. Theoretically, these standards apply also to the submanufacturing establishments, but there the union cannot enforce them, and consequently the inside manufacturers cannot compete and are obliged to discontinue their policy of producing on their own premises.

Mr. Dyche holds that there is no way of controlling standards of submanufacturers, and that the only remedy is abolition of the system. This remedy, however, cannot be applied unless the Union and the manufacturers can establish some joint control instead of wasting their energies in constant warfare while the outside shops flourish.

On three specific charges he finds the Union guilty: first, in permitting shop strikes in violation of the agreement; second, in denying the employer the right to hire and fire and thus be assured of efficient production; and third, in refusing to allow a reduction in wages "even when they are above the Union scale." "These three things tend to destroy, to hinder the standardization of labor cost" (p. 131).

In spite of Mr. Dyche's condemnation of the Yiddish workers on the ground that they are easily led, nevertheless he compliments them on the possession of such excellent qualities as "absence of blind obstinacy, a mental agility, a capacity to change, to adapt themselves to a new environment" (p. 21). His faith in these traits, evidently, is what gave him the courage to state his views so openly, sparing neither union member nor leader, and still to hope for an audience for his constructive proposal.

By means of co-operative counsel between manufacturers and the union, he would eliminate the jobber-submanufacturing system. He would also instal "a permanent Board of Labor Standards, of Industrial Engineers or economists working with the aid of a staff of statisticians, not of 'disinterested outsiders,' but of 'interested insiders'" (p. 213). He would have this board enforce the standards by inspection, as in the case of the enforcement of the Sanitary Code. The in-

spectors would do the work now undertaken by union business agents, and much friction would be avoided.

The book is not that of a scientific investigator, but rather that of one who has been in the movement and has analyzed the problem on the basis of his own experience. His attitude toward outsiders—"uplifters" and arbitrators—may be mistaken; his condemnation of the union may be somewhat harsh; his faith in the possibility of co-operation between employers and union may be utopian; but there is little doubt that he is sincere in his purpose to find "a real remedy for the evils from which the workers are suffering."

UNIVERSITY OF CHICAGO MABEL MAGEE

Economia dei Trasporti Marittimi. By EPICARMO CORBINO. Città di Castello: Soc. An. Tip. "Leonardo da Vinci." Pp. xiv+379. Lire 45.

Professor Corbino needs no introduction to students of ocean transportation. His various works on that and allied topics have already won for him a place among the best-known writers in this field. In this book on the economics of maritime transportation he makes an important contribution to the literature on this particular subject.

The principal object of this study is to investigate all the elements which affect the economic aspects of maritime transportation, and to present the results in non-technical terms. A secondary object is to elaborate that part of the immense mass of statistical material on international commerce which deals with the demand for maritime transportation. In both respects the book is successful.

The work is divided into three parts, the first of which deals with the demand for maritime transportation. Here the author makes a detailed analysis of the growth in volume of international trade in such goods as coal, cereals, metals, drugs, passengers, and mail, etc., tabulates this information, draws conclusions concerning periods of activity and depression in trade, and studies the correlation between such things as the movement of goods, navigation, exportation of coal from England, quantitative data on production and consumption of various goods, and so on. The period 1909–13, which he considers to be normal, is examined in great detail as a basis for the further analysis of changes brought about by the recent war. Of less interest, perhaps, is his discussion of such topics as the competition between liners and independent ships and between land and ocean transportation.

In Part II the author studies the supply of maritime transportation, discussing the passing of sailing vessels and the development of steamships, the increase in world-tonnage, its distribution, and its periodical variation from 1851 to 1914. He also analyzes in great detail, and gives a historical résumé of, various elements that enter into the cost of producing maritime transportation, and includes a classification of world-tonnage according to age and tonnage, as of July 1, 1923. One chapter deals with the cost of establishing and operating a steamship line, and with recent concentration of ownership in the shipping industry.

Part III deals with shipping charges, their determination, and the causes of their variation. First the author applies the theory of supply and demand to the problem of the determination of a general rate; then variations in particular rates caused by special influences, such as the duration of the voyage, possibility of a return cargo, and so forth, are discussed. An entire chapter is given to a historical review of variations in shipping charges each year from 1869 to 1923. Last comes a discussion of various aspects of state intervention in maritime transportation. There is an appendix in which are eleven full-page tables containing much of the statistical data used in the text.

In several respects this study deserves special notice. The collection, tabulation, and analysis of such a great mass of statistical data, and especially that part which concerns the demand for maritime transportation facilities, is a contribution of considerable importance. It is true that much of this comes from such authoritative writers as Schmoller, Roscher, Klosterman, Scherzer, Clive Day, Kirkaldy, Jevons, and J. Russell Smith. Nevertheless Professor Corbino has elaborated and adapted it to his purpose most admirably. There are almost fifty tables, many of them covering a full page. That other writers will, later on, still further elaborate this statistical material and draw from it more exhaustive conclusions the author not only admits, but even hopes. It is probably safe to say, however, that this will not be done soon.

The study is world-wide in scope. Not only does it include all countries, but it views maritime transportation in a wide sense as including ocean transportation and that on internal waters which is destined for the sea and may be effected without involving a change of cargo from one ship to another. With purely inland trade he is not concerned.

In the arrangement of its material the book is unique. At first

sight one gains the impression that it is intended to be primarily a study of the value of maritime shipping facilities. The first part is a study of demand; the second, of supply; and the third, primarily of shipping charges. It is not, however, a theoretical study of the latter; rather it is a running statistical commentary on all economic aspects of the subject. Most of the theory is localized in the chapter on the determination of shipping charges and their variations. Here particularly, and throughout the book generally, one sees the influence of the late Professor Alfred Marshall.

The style is free and flowing. It is unfortunate that so few American economists are able to read Italian. Those who can will profit by reading this important addition to the world's literature on the economics of maritime transportation.

DOMENICO GAGLIARDO

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Les Grands Économistes—Textes et Commentaires. By PAUL GEMÄHLING. Paris: Recueil Sirey, 1925. Pp. xi+330.

Professor Gemähling, in writing this book, has had in mind the problems of the French *débutant* in economics, who, he feels, should become acquainted with the masters of the science through an actual reading of the most important parts of their works. Accordingly he has given us a careful selection of texts from Aristotle, St. Thomas Aquinas, Quesnay, Turgot, Hume, Condillac, Adam Smith, Malthus, J. B. Say, Ricardo, Cournot, Proudhon, List, John Stuart Mill, Marx, Menger, and Walras. Each selection is accompanied by a brief biography of its author, a bibliography, and commentaries. In all cases where it was necessary to present a translation of the text, the author has either revised the standard French translations or made new ones.

In the preface to this book Professor Gemähling sets forth his ideas on the value of the study of the history of economic doctrines as well as on the methods to be employed in its study. He appears to favor the method of instruction known in France as *explication de textes*, which has been applied with such success to the study of literature, languages, and philosophy, and which has undoubtedly done so much to develop the scholarly and critical attitude. This method consists of a very detailed study of selections from the texts of the masters of the subject under consideration, with the intention of establishing

the precise meaning of each thought expressed, its history and sources, and the social environment which, in part, conditioned it, together with a critical appreciation of its importance, application, and exactness.

The object of Professor Gemähling's book is to introduce this method in the study of the history of economic doctrines and to facilitate its use by French professors and students. In the preface the author explains and justifies his position.

Professor Gemähling first shows the utility of the study of the history of economic doctrines, and then goes on to explain that if this discipline is to keep its place beside experimental research as a means of forming the intellect, it must prepare directly for this research and not divert from it. For this purpose it must not continue as a mere paraphrase of the doctrines of the masters of the science, or as a work of vain erudition. The great systems of economic thought must be studied in the texts themselves—and with respect for these texts—as well as in connection with the historical facts which conditioned them, for

> In the history of thought, as in that of living beings, there is no spontaneous generation; every doctrine is a product of history, of the history of ideas and the history of facts, and it is only in replacing it [the doctrine] in the *milieu* where it was formed that we may truly understand it, seize the internal logic of it, and discover, at the same time as the causes which gave it birth, those which should make it disappear.
>
> Undertaken in this spirit, at once critical and explicative, in constant contact with the *fact*—I wish to say with the text itself and with the historical *milieu* which gave it birth—the history of economic doctrines may constitute a truly formative discipline for the intellect, and become a precious auxiliary of the positive method itself.

Professor Gemähling's book sets a standard of scholarship worthy of wide imitation.

MAX J. WASSERMAN

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Statistics as Applied in Business. By BENJAMIN FRANKLIN YOUNG. New York: Ronald Press, 1925. Pp. xii+639. $5.00.

This is one of a very small number of books on statistical methods which give attention to the problem of internal statistics as well as to that of external statistics. Of the ten chapters dealing with the facts

needed by a business, six are given over to a statement of the specific internal and external data that should be available. A rather suggestive chapter is the one on sources of internal facts, which considers the company records which may serve to supply internal data. The collection of primary data is considered from the point of view of internal and of external statistics, the problems in the two cases being separately discussed. A vague distinction is made between "primary collection" and "original collection."

The chapter on sampling would be greatly improved by the inclusion of descriptions of some practical applications of the sampling method and a discussion of the sampling formulas which are not mentioned. Speaking of the frequency series (p. 392), Mr. Young tells us, " . . . . We have a variety of forms, the most frequent of which in practical business statistics is the bell-shaped distribution." He later states (p. 398), "In practical business statistics frequency series are generally asymmetrical in character."

The methods of computation of the arithmetic mean and the coefficient of correlation, as well as the procedure for the determination of secular trend and seasonal variation, have been relegated to an appendix in lieu of being presented with their appropriate text discussions. An apparently irrelevant sentence has slipped in on page 433. By use of the geometric mean it is shown that if the average rate of pay for typists increased 30 per cent from January, 1917, to January, 1920, the mean annual rate was 9.1 per cent. Then follows, "Thus the average annual percentage increase is 8.2 per cent as against 13⅓ obtained by dividing 120 by 9."

The harmonic mean is discussed and its computation illustrated, but the reader is left somewhat at a loss as to what its practical application may be. Mr. Young says (p. 435), "Its chief use in business management is in determining average performance. It may also be required in problems involving prices stated in terms of so much of a commodity for a *unit of money* or so much money for a *unit of the commodity*." The standard deviation is denoted by S.D. instead of σ; no description of the short method of determining σ is given; and on the whole Mr. Young prefers the average deviation. On page 446, in speaking of " . . . . the first and third or upper and lower quartiles," he reverses the usual identification of the quartiles.

In a brief chapter on index numbers we are rightly cautioned against the use of a general-purpose index number when a special-purpose index would serve better. When it comes to the problem of com-

bining quotations, weighting is considered as if the procedure were the same whether we are dealing with relatives or with actual prices. The short method of shifting the base is acknowledged to be less accurate than the longer one of recalculation, but " . . . . it is for the most part sufficiently accurate for practical purposes."

The concluding section of the book contains chapters dealing with "Mechanical Aids in Statistical Work," "Statistics and Accounting," and "Organizing for a Program of Statistics." In the appendixes, of which there are six, are included a worth-while section on "Suggested Statistical Reports and Statements," a four-place logarithm table, and suggested problems arranged by chapters.

COLUMBIA UNIVERSITY FREDERICK E. CROXTON

Present-Day Banking in India. By B. RAMACHANDRA RAU. Calcutta: University of Calcutta, 1925. 2d ed. Pp. xi+311.

The first edition of Mr. Rau's book, which appeared in 1922, has been worked over, and some of the material, in particular the chapters on the presidency banks and the Central Bank, removed from the text to the Appendix, while other parts have been brought down to date. However, the second edition embodies the main conclusions of the earlier edition.

In the first chapter the author classifies the Indian money market into (*a*) the European money market, which contains the Imperial Bank and the exchange banks, and (*b*) the Indian or native money market, which embraces the Indian joint-stock banks and the indigenous bankers or money-lenders; and this classification forms the basis for his discussion in the succeeding chapters. The concluding chapter deals with banking reform in India and consists largely of what the author considers desirable innovations and changes. The Appendix contains historical and statistical material of some interest.

The author has read widely, especially in the older banking literature, and makes copious references; but the frequency of the quotations in the text mars its readability. It would be an improvement if many of them were relegated to the footnotes. The index is fair, but not exhaustive, while a page and a half of errata indicates the number of typographical errors. The references to the banking system of the United States are mostly in terms of the National Bank Act rather

than the Federal Reserve Act, with the result that some of the statements made do not hold for the present time. For example, on page 82 it is stated that "The Act [i.e., The National Bank Act] prohibits the banks to lend on real estate," and the reader is left with the impression that this is the present situation, while in reality the Federal Reserve Act (Sec. 24, F. R. Act 1916) permits the national banks to lend on real estate, outside of central reserve cities and with some limitations. His attitude toward branch banking is somewhat eulogistic, while his discussion of it is hardly satisfactory. The Canadian branch system is quoted with approval; but while the general body of Canadian people probably approve of the branch system, it has been under sustained fire from the agricultural class, which is one of the particular classes in India which Mr. Rau wishes to benefit by an extension of banking facilities through branch banking. While one might agree with the author in his conclusions with respect to branch banks, the question is a much more difficult one than is indicated by his treatment.

Inasmuch as the Indian banking system is more or less a closed book to most Occidentals, Mr. Rau's study makes very interesting reading. However, one cannot help wishing it were more descriptive and analytical and somewhat less recommendatory. This may be of lesser importance from the Indian viewpoint, but for an outsider a more descriptive and objective treatment would be of much greater value.

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